BLACK-TAILED PRAIRIE DOG SURVEYS OF BLM LANDS IN EASTERN COLORADO

A Report to the Bureau of Land Management, Canon City Office
By
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March 2004

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INTRODUCTION

The following report summarizes the research effort conducted during the summer of 2003 on Bureau of Land Management (BLM) property in eastern Colorado. BLM lands in Crowley, Otero, Pueblo and eastern Huerfano counties were not visited since these areas were investigated the previous summer (see Sovell 2003). Rare species tracked by the Colorado Natural Heritage Program were recorded during this work, both at BLM sites and traveling to them.

The black-tailed prairie dog (*Cynomys ludovicianus*) is a colonial ground squirrel and one of five species in the genus Cynomys, all of which occur in western North America. Black-tailed prairie dogs live in colonies or "towns" in short and mixed grass prairies where the landscape is characterized by dry, flat, open grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle. By colonizing areas with low vegetative stature, prairie dogs often select areas with past human (as well as animal) disturbance. In North Dakota and Montana, colonies are associated with areas heavily used by cattle, such as water tanks and long-term supplemental feeding sites, and these structures may even encourage prairie dog colonization (Licht and Sanchez 1993). In these disturbed open areas with little cover the "early warning" system against predators afforded by colonialism is optimized.

Prairie dogs are proposed as keystone species in North American grasslands (Miller et al. 1994); impacting grassland ecosystems by increasing habitat heterogeneity, modifying ecosystem processes, and enhancing regional biodiversity (Ceballos et al. 1999). This viewpoint, however, is not without controversy. Knowledge of the effects prairie dogs have on grassland ecosystems may be more limited and equivocal than has been recently proposed (Stapp 1998). Stapp (1998) suggests, given the variation in grasslands inhabited by prairie dogs (e.g. mixed vs. shortgrass prairies), that they may affect the flora and fauna of these systems in variable ways not yet fully understood. That prairie dogs have effects on many animals including Burrowing Owls, Mountain Plovers, song birds, Ferruginous Hawks and black-footed ferrets is acknowledged (Knowles et al. 1982, Desmond and Savidge 1996, Plumpton and Anderson 1998, Barko et al. 1999, Kotiliar et al. 1999). And efforts directed towards conservation of prairie dogs will positively impact these species.

Black-tailed prairie dogs prefer fine to medium textured soils (Merriam 1902, Koford 1958), presumably because burrows and other structures tend to retain their shape and strength better than in coarse, loose soils. In addition, loose soils such as sand often support larger, coarser graminoids with lower forage quality and prairie dogs may avoid these forages and their associated soils (NatureServe 2000). Colonies commonly are found on silty clay loams, sandy clay loams, and loams (Klatt and Hein 1978, Agnew et al. 1986). Encroachment into sands (e.g., loamy fine sand) occurs if the habitat is needed for colony expansion (Osborn 1942).

Shallow slopes of less than 10% are preferred (Dahlsted et al. 1981), presumably in part because such areas drain well and are only slightly prone to flooding.

Prairie dogs prefer graminoids, focusing their herbivory on leaf bases (Koford 1958, Hansen and Gold 1977, Uresk 1984, Krueger 1986). The proportion of other forage types in the diet varies with season, location of forage on towns, and vegetative composition (Fagerstone 1981). Prairie

dogs apparently do not require free water (Bintz 1984), obtaining it during summer from green grass and forb shoots, which are about 68-77% water (Bintz 1984), and in winter, from succulents such as *Opuntia* spp., which are about 80% water (Fagerstone et al. 1981).

Historical estimates indicate that prairie dogs once occupied 100-200 million acres in North America, originally extending from extreme southern Saskatchewan, Canada, to the desert grasslands of the southwestern U.S. and adjacent Mexico, and from the Rocky Mountain foothills east to the central Great Plains (Goodwin 1995) (Fig. 1). Three major events within the last 100 years have been significantly contributed to the decline of prairie dogs. First, prairie in the eastern portion of the range was converted to farmland from 1890 to 1930. Second, between 1920 and 1970, large scale poisoning occurred on most western rangelands (Hoogland 1995). Finally, sylvatic plague capable of killing 99% of a colonies population was introduced into the North American prairie ecosystem around 1900 and has severely impacted the species (Cully 1989, Oldemeyer et al. 1993). The disease was first documented in black-tailed prairie dogs from Texas in 1946-47.

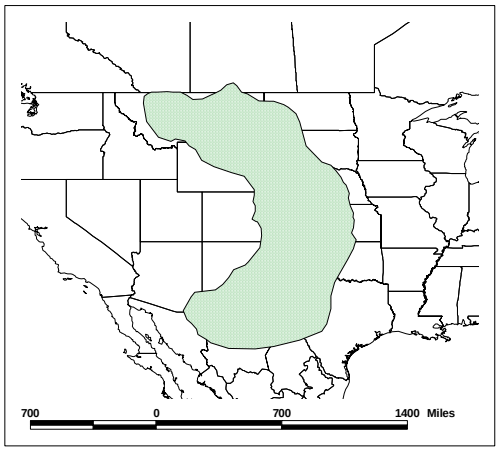

Fig. 1 Historic distribution of black-tailed prairie dog in North America (from Goodwin 1995)

Significant contractions leaving few or no prairie dogs remaining have occurred on approximately 20 percent of the original range. In addition, approximately 37 percent of the historical range has been converted to cropland, and abundance and extent of occupied habitat have declined by 94-99 percent since about 1900 (see USFWS 2000). Black-tailed prairie dogs are now extirpated from southeastern Arizona (NatureServe 2000), southwestern New Mexico (NatureServe 2000), the Sonora and most of Chihuahua in Mexico, and locally in many areas throughout the range, primarily as a result of the above-mentioned factors. Without further information on the effects that reduced populations, smaller average colony sizes, fragmentation of habitat, and introduced sylvatic plague have on the species demography, viability of current populations will remain uncertain.

In Colorado, black-tailed prairie dogs occupy the eastern 40 percent of the state, inhabiting shortgrass prairie and other areas of low-growing vegetation (Fitzgerald et al. 1994) (Fig. 2a). Throughout the range in Colorado, prairie dogs occur at much lower densities and in smaller colonies than history predicates (Fitzgerald et al. 1994). The distribution of black-tailed prairie dogs in eastern Colorado reported by EDAW (2000) and compiled from records of historical locations, aerial photos and recent research on current distributions, indicates that even less area is occupied than proposed by Fitzgerald et al. (1994) (Fig. 2b). Large areas of suitable habitat are unoccupied in 12 eastern Colorado counties according to the NDIS GIS data layer, and prairie dogs have been extirpated from eastern Huerfano County, Colorado.

The decline in black-tailed prairie dog populations throughout North America caused the USFWS to designate the species as a Candidate throughout its entire range on February 4, 2000 (65 FR 5476). The USFWS (Federal Register, 25 March 1999) found that a petition to list this species as threatened under the U.S. Endangered Species Act presented substantial information indicating that listing may be warranted; a status review was initiated and the USFWS (2000) determined that listing as threatened is warranted but precluded by actions of higher priority.

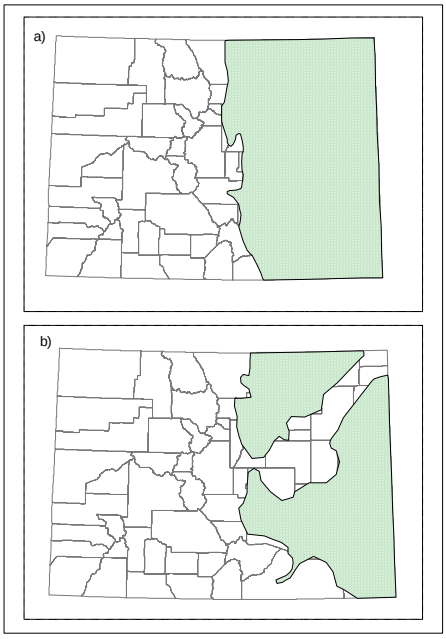

Fig. 2 Present distribution of black-tailed prairie dogs in Colorado: a) from Fitzgerald et al 1994; b) compiled from NDIS GIS coverage from EDAW 2000.

METHODS

The Canon City District of the BLM supplied updated maps of the BLM parcels within the study area. These maps were used to truth BLM data layers that CNHP had for the study area. The NDIS GIS data layer on prairie dog distributions in Colorado and the BLM data layer were integrated and each BLM parcel in the study area and any surrounding prairie dog colonies were identified. Visits to each BLM parcel and any surrounding prairie dog colonies were than scheduled. An early attempt was made to visit colonies identified by EDAW (2000) and mapped on the NDIS data layer, to determine the accuracy of those findings. However, the task proved untenable, and time and effort were focused on visiting BLM holdings. Given the wide distribution of BLM land in eastern Colorado, CNHP researchers traveled over 8,000 miles during the work.

Access to the majority of the sites required traveling through private property, and substantial time and effort was put into identifying the proper landowners. Appendix IV identifies each landowner, and associated contact information, as well as the legal description of the affiliated BLM site. A substantial amount of time and effort was put into compiling this critical data. County Assessor's offices were visited for most counties in the study area to determine land ownership. Landowners were then contacted to request permission for access. Private land was not entered without permission of the property owner. If permission to access could not be obtained or was denied, a roadside survey was performed where applicable. All roadside surveys are noted in the parcel summaries section. If a roadside survey was not possible, then a prediction of the probably habitat was offered. This was based on the GIS data and the researchers knowledge of the local ecology. See Appendix I for a summary of the critical information found at each site.

At each BLM site visited, data was collected on the date of visitation, surveyors name(s), parcel location, directions to parcel, sensitive species present, all species present, ecological condition, landscape context, vegetation descriptors including the dominant vegetation and percent trees, shrubs, grasses and forbs present. In addition, data on the aspect, slope, soil texture and other management considerations were also collected (see Appendix II). An attempt was made to digitally photograph every BLM parcel visited (see attached digital picture file). The data

collected documents the habitat and topographic characteristic of each parcel, supplying information for assessing each parcel's likelihood of supporting prairie dogs. Characteristics used to define potential prairie dog habitat include percent slope (2-4% preferred), soils (deep well-drained sandy-loam to clay-loam preferred), vegetation composition (*Bouteloua gracislis-Buchloe dactyloides* dominated landscapes preferred), and land tenure. A CNHP element occurrence datasheet (see Appendix III) was also completed for animals tracked by CNHP and observed at BLM parcels. This same information was recorded for animals tracked by CNHP and serendipitously observed anywhere during the survey.

During completion of field work all prairie dog colonies and observations of other sensitive species were mapped on either 1:100,000 topographic maps. This information was then transcribed into ArcView for map production and data analysis. Information on the study area including its size, the area of suitable prairie dog habitat as mapped by Fitzgerald et al. (1994), area of current prairie dog distribution as defined by EDAW (2000), area currently occupied by prairie dog complexes, and the acres of BLM property surveyed were calculated using ArcView data layers that are part of CNHPs data library.

RESULTS

Study Area

The study area was divided into a north and south area. The north area covers BLM land in Weld, Morgan, Washington, Logan, Sedgwick, Yuma and northern Lincoln Counties. The southern study area contains BLM property in El Paso, Lincoln, Kiowa, Bent, Prowers, Las Animas and Baca Counties. The north study area contains 1,754 acres of BLM land, while the southern study area totals 13,821 acres of BLM property (Figs 3 and 4).

Many BLM parcels exist in eastern Colorado, thus parcels that were in close proximity to one another and having similar habitat types were grouped together, resulting in 93 total sites. All but 12 of the sites were visited during summer 2003 fieldwork. Access was denied to five of the unvisited sites, and permission could not be obtained for five as well. One site was not visited after it was learned that access to two nearby parcels was denied. Finally, one site was not visited because it is no longer BLM property and ownership was transferred to the surrounding landowner. This was confirmed with both the landowner and BLM.

There are 171 total BLM parcels in the study area and for the purposes of this study, BLM parcels in close proximity to one another and having similar habitat types were grouped together resulting in 136 parcels. Of these 136 parcels, 28 are located in Crowley County, 38 in eastern Huerfano, 16 in Otero and 54 in Pueblo. Permission to access eight parcels, numbered H26-H28 and H31-H35 in eastern Huerfano County, was not granted by the landowner. In addition one small 40-acre parcel was missed in Crowley County, otherwise all of the remaining 128 parcels were visited (Fig. 4).

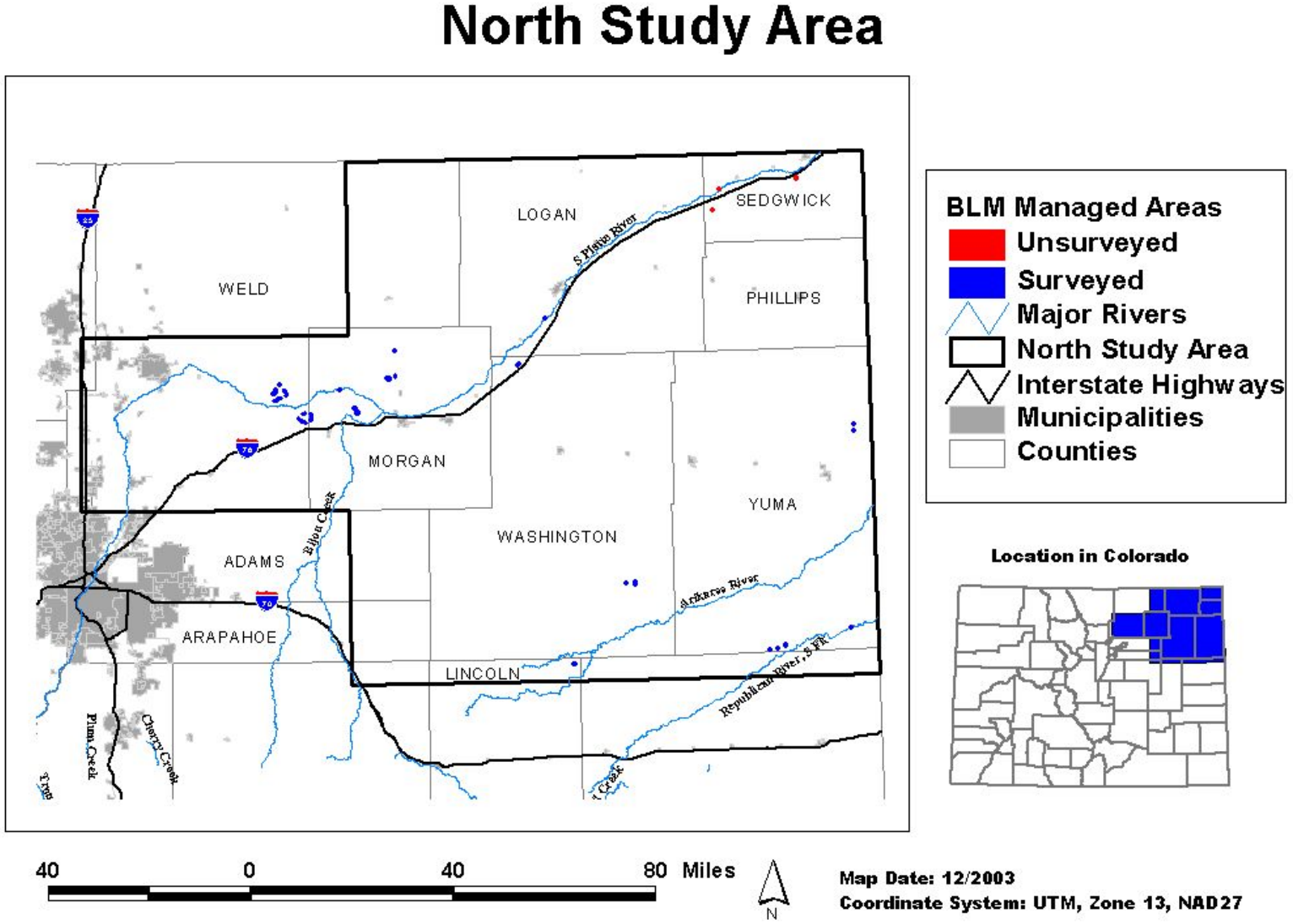

Fig. 3. Map of the north study area in eastern Colorado including location of BLM sites (see county maps for detailed locations).

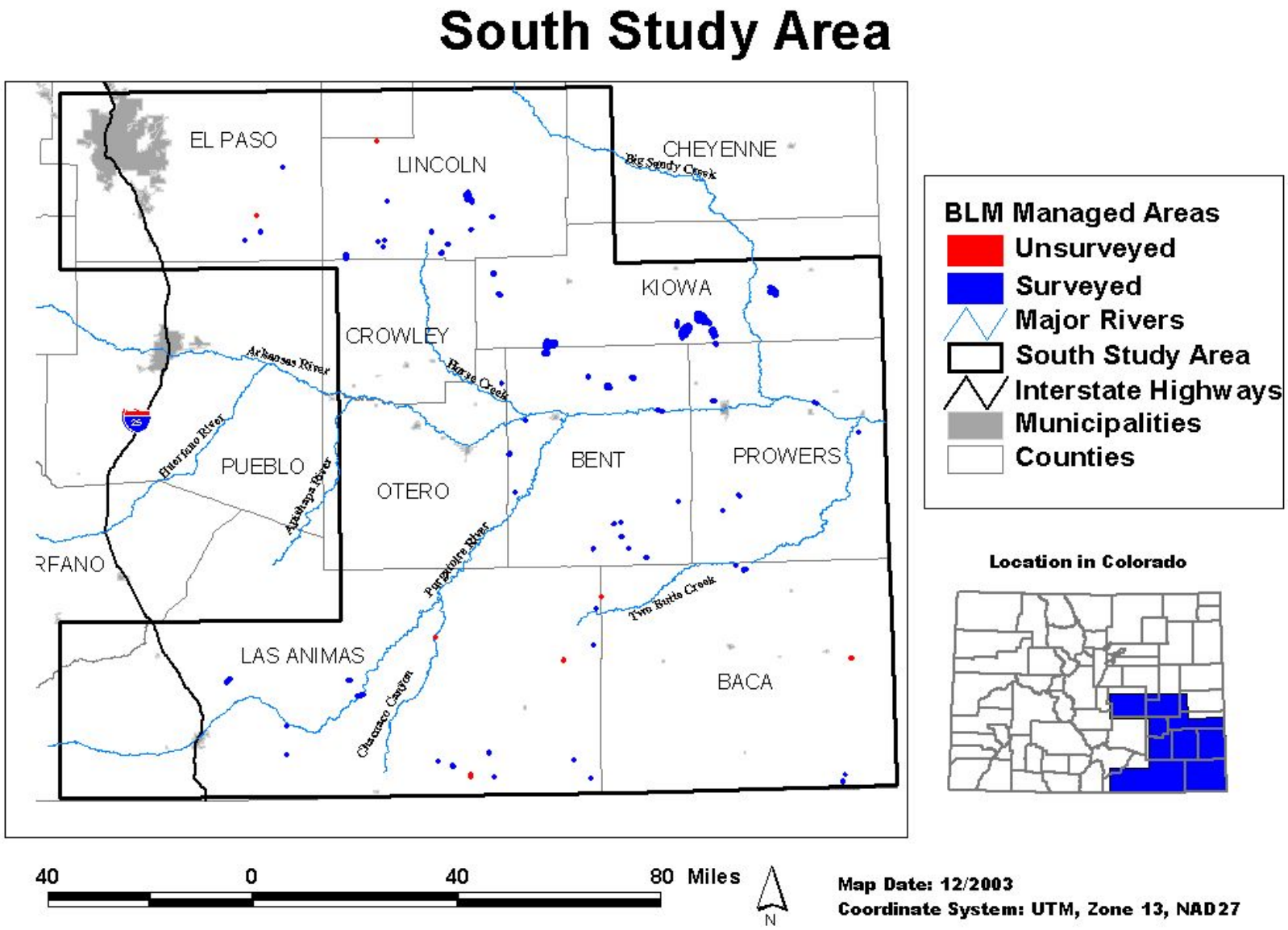

Fig. 4. Map of the north study area in eastern Colorado including location of BLM sites (see county maps for detailed locations).

Element Occurrences of Animals Tracked by CNHP

A total of 60 newly recorded occurrences of rare and uncommon animals, including five different species tracked by the CNHP, were recorded during the course of this project (Table 1). These occurrences were found throughout the study area, but with majority of the observations being found in the larger south study area (Figs. 5-7). The majority of these occurrences were black-tailed prairie dog colonies. Also observed during this project were Burrowing Owls (on the CNHP watch list), Mountain Plovers, Swift Fox and Long-billed Curlews.

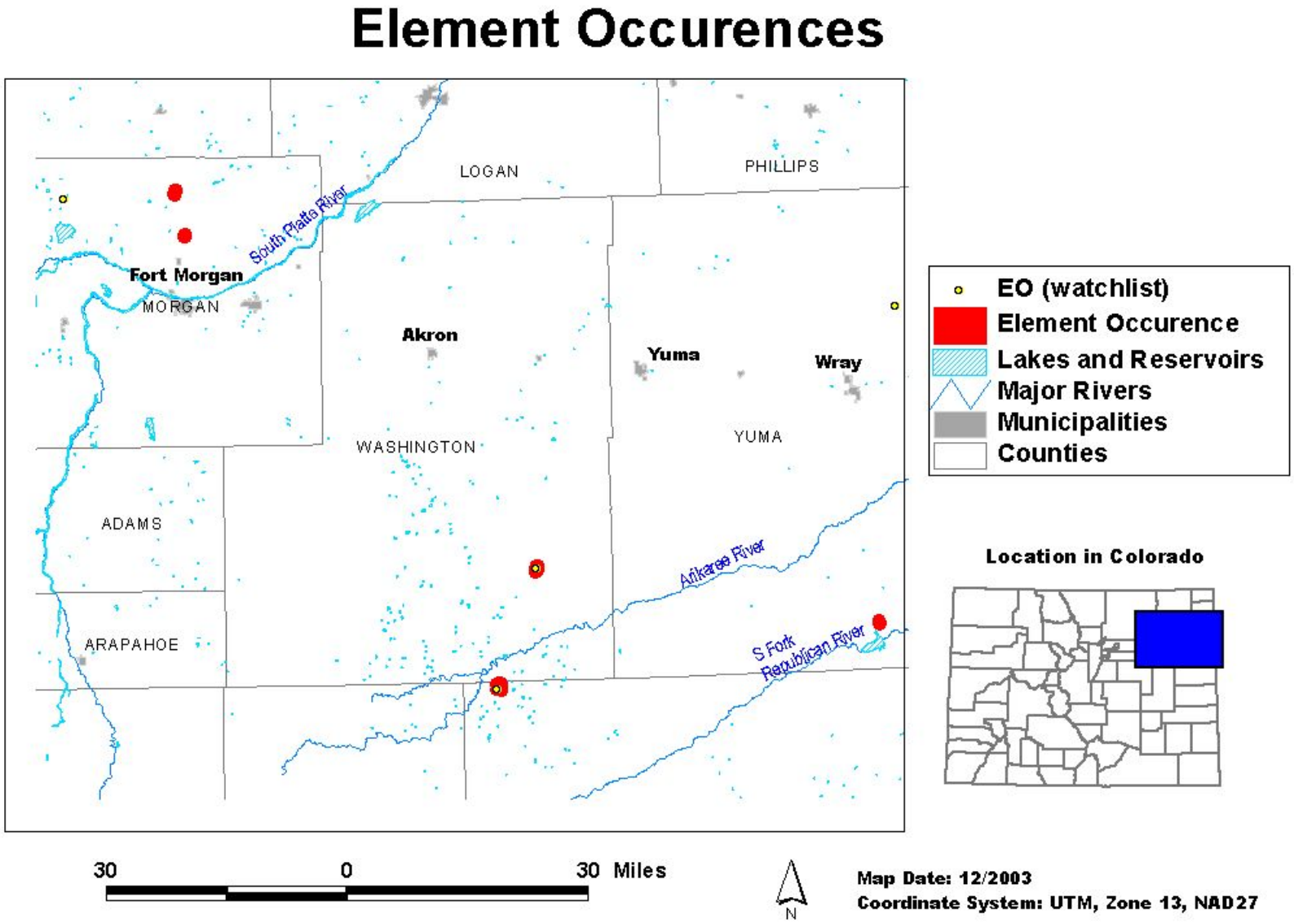

Fig. 5. Element Occurrences recorded in the North Study Area. Burrowing Owls are the only species from this project found on the CNHP watch list.

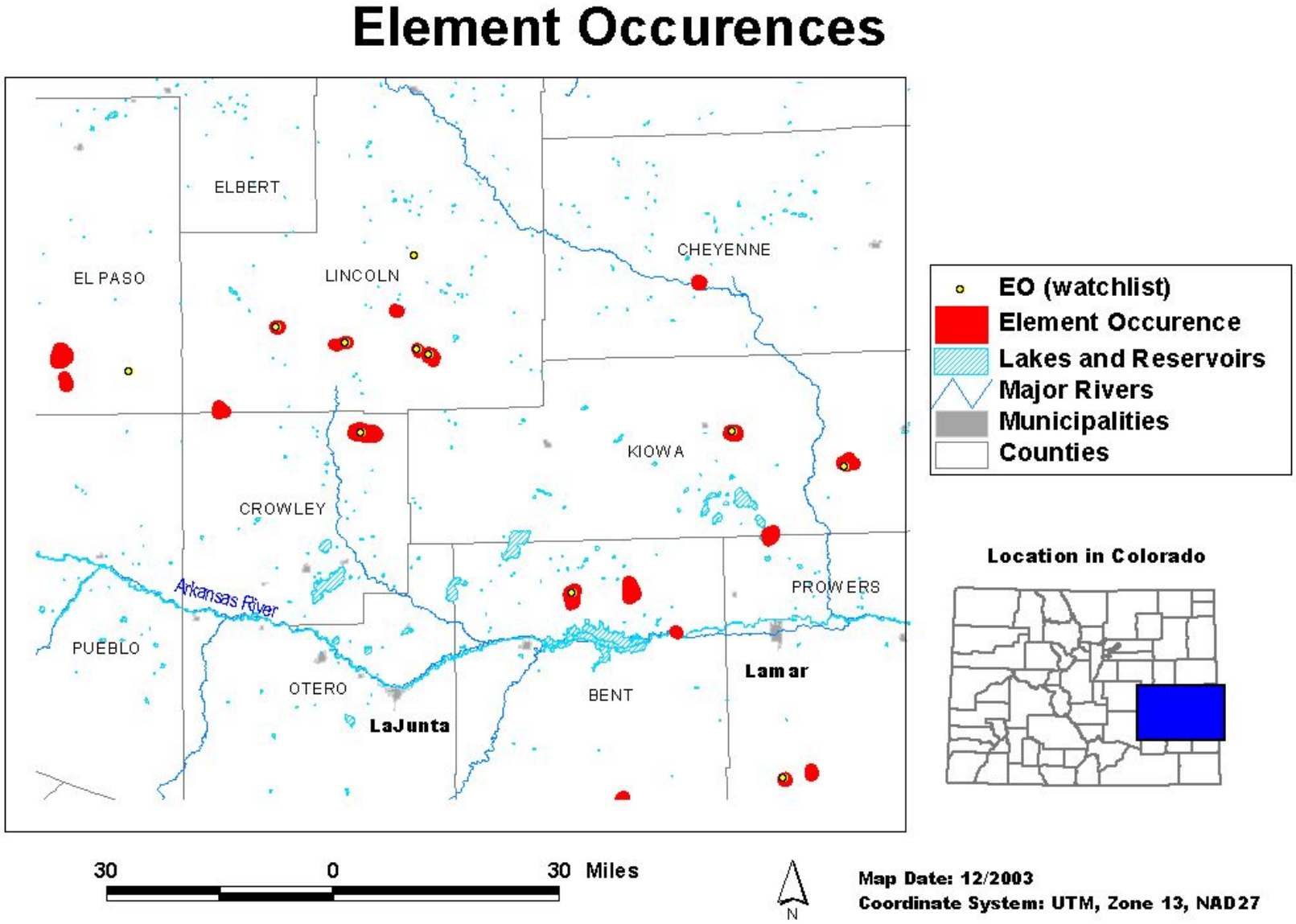

Fig. 6. Element Occurrences recorded in the northern part of the South Study Area. Burrowing Owls are the only species from this project found on the CNHP watch list.

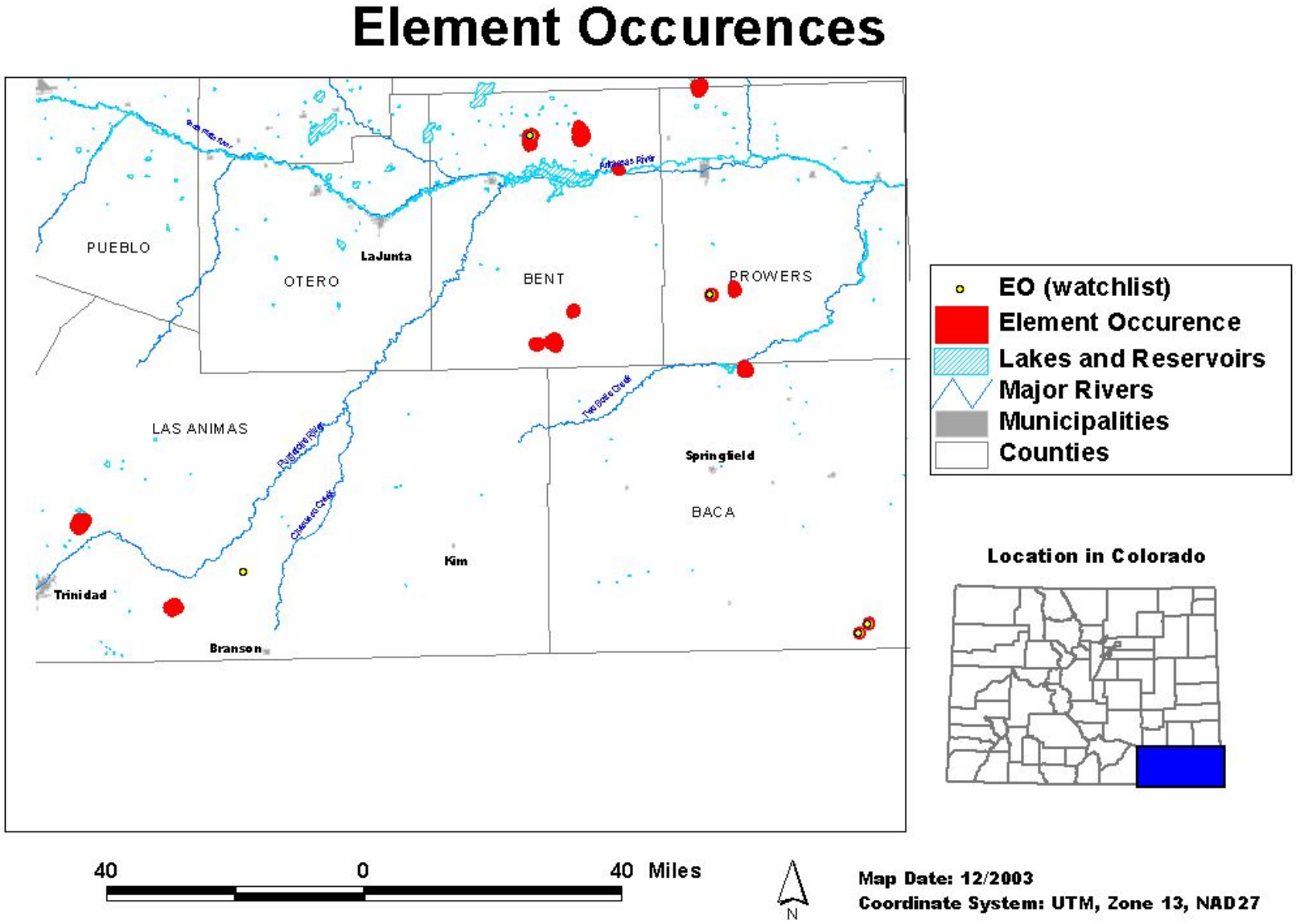

Fig. 7. Element Occurrences recorded in the southern part of the South Study Area. Burrowing Owls are the only species from this project found on the CNHP watch list.

Table 1. The rare and uncommon animal species tracked by the CNHP recorded during the course of this project

Birds

Order CHARADRIIFORMES		**Number of**	**CNHP Status and Ranking**		**Regulatory Status**		
Scientific Name	**Common Name**	**Occurrences**	**Global Rank**	**State Rank**	**Agency Sensitive**	**Federal Status**	**State Status**
Charadrius montanus	Mountain Plover	3	G2	S2B, SZN	FS/BLM	C	SC
Numenius americanus	Long-billed Curlew	2	G5	S2B, SZN	FS/BLM		SC
Order STRIGIFORMES							
Athene cunicularia	Burrowing Owl	18	G4	S4B	FS		T

Mammals

Order RODENTIA							
Cynomys ludovicianus	black-tailed prairie dog	34	G4	S4			
Order CARNIVORA							
Vulpes velox	Swift Fox	2	G3	S3	FS	C	SC

Parcel Summaries

The following are summaries of each site visited including documentation of the habitat types at each parcel and a qualitative assessment of each parcels likelihood of supporting prairie dogs. A synopsis of this information can be found in Appendix I. See Appendix V for a list of all the common and scientific names of plants cited in this report.

Baca County

There are nine sites in Baca County, found throughout diverse terrain. Six of these sites were visited in the field, while permission was not obtained for two sites, and access was denied to the final site. A black-tailed prairie dog colony is found on site Ba2 and the area adjacent to that site.

Ba1

The landowner would not grant permission to access this 35-acre parcel in northwestern Baca County. The parcel was located several miles from the nearest public road, so a roadside survey was not completed for this parcel. This site is located in an area where the landscape is broken by numerous canyons. These areas typically have a good amount of pinyon-juniper cover and shallow, rocky soils. Based on these factors, the habitat suitability ranking for black-tailed prairie dogs at this site is poor. No pictures exist for this parcel.

Ba2

This 23-acre parcel is located in northern Baca County, just east of Two Buttes Reservoir. The pictures that correspond to this parcel are 132 and 133. Shortgrass prairie is the dominant vegetation type, with buffalograss and red-three awn dominating the graminoid layer. Yucca dominates the shrub layer and associated forbs include thistle, Indian blanketflower, scarlet globemallow and annual pricklepoppy. There is a northwest facing slope of 2-4% and the associated soil is a clay loam. The site is excellent habitat for black-tailed prairie dogs and associated species and there is a colony that extends onto the parcel. …… Two Buttes Creek runs within 0.25 miles to the north of the parcel. Due to this, colony expansion could only occur to the south of the parcel.

Ba3

This 160-acre parcel is located in northern Baca County, just south of Two Buttes Reservoir. The pictures that correspond to this parcel are 135 and 136. The reservoir appeared to be dry at the time of observation, except the area immediately upstream of the dam. The portion of this site that is indicated on the map to be inundated with water was not. This area contained many ruderal species. There is a fair amount of cottonwood cover along the shoreline, with shortgrass prairie and interspersed shrubs occupying the majority of the upland portion of the site. Red-three awn, buffalograss, black grama, yucca, and slimflower scurf-pea dominate the upland growth forms. There is a north facing slope of 2-10% with sandy loam soils at the site. Potential black-tailed prairie dog habitat at this site is poor based on the high density of trees and shrubs at the site. The likelihood that this parcel would support prairie dog populations in the future is poor.

Ba4
This 36-acre parcel is located in northern Baca County, just upstream of Two Buttes Reservoir and on the south side of the stream channel that feeds the reservoir. Picture 131 corresponds to this parcel. The plant community is shrubland, dominated by sand sagebrush and yucca. Western wheatgrass and cheatgrass dominate the graminoid layer, while kochia was the dominant forb. There is a north facing of 2-6% and soils are composed of sandy loam and loamy sand. Potential black-tailed prairie dog habitat at this site is poor and the likelihood that this parcel would support prairie dog populations in the future is also poor.

Ba5
Permission to access this 17-acre parcel was not obtained, therefore the parcel was not visited. The site is located in east-central Baca County, approximately 5 miles southeast of Walsh, CO. According to the GAP vegetation layer, the dominant community of the site is shortgrass prairie. There is also irrigated agriculture in the area. However, based on the vegetation and gentle topography of the area, this site most likely represents potential black-tailed prairie dog habitat, at least historically. There are no pictures of the site.

Ba6
This 35-acre parcel is located in southeastern Baca County, approximately 0.5 miles north of the Cimarron River. The pictures of this parcel are 137-138. The dominant community of this site is sand sagebrush shrubland. Junegrass, sand dropseed and buffalograss dominate the graminoid layer and the forb layer is composed of numerous weedy and ruderal species such as ragweed, kochia and sunflower. There is a north facing aspect of 2-4% with sandy soils. Potential black-tailed prairie dog habitat at this site is poor and the likelihood that this parcel would support prairie dog populations in the future is also poor.

Ba7
This 19-acre parcel is located in southeastern Baca County, approximately 2 miles north of the Cimarron River. The pictures of this parcel are 139-140. The dominant vegetation at the site is shortgrass prairie and shrubland. Sand dropseed and sand sagebrush dominate the graminoid and shrub layers, respectively. Russian thistle is the dominant forb of the parcel. There is an east facing slope of 2-8%, with sandy loam soils. Potential black-tailed prairie dog habitat at this site is poor and the likelihood that this parcel would support prairie dog populations in the future is also poor.

Ba8
Permission to access this 7-acre parcel was not obtained, therefore the parcel was not visited. The parcel is located in southeastern Baca County, in the sandy Cimarron River floodplain. The dominant community of the site is presumed to be a riparian community dominated by cottonwood and tamarisk, and resemble the vegetation of nearby parcel Ba9. Based on these factors, potential black-tailed prairie dog habitat at this site is poor and the likelihood that this parcel would support prairie dog populations in the future is also poor. There are no pictures of the site.

Ba9

This 13-acre parcel is located in southeastern Baca County, bisected by the Cimarron River stream channel. Photos numbered 141 and 142 represent this parcel. Cottonwood and tamarisk dominate the vegetation of this site, with an understory represented by sand dropseed and alkali sacaton. Sunflower and a host of other ruderal forbs are also present at the site. There is an east/northeast facing slope of 0-2% on sandy/sandy loam soils. The stream channel was dry, except for isolated pools. Potential black-tailed prairie dog habitat at this site is poor and the likelihood that this parcel would support prairie dog populations in the future is also poor. However, numerous bird species were heard in this fairly dense riparian habitat.

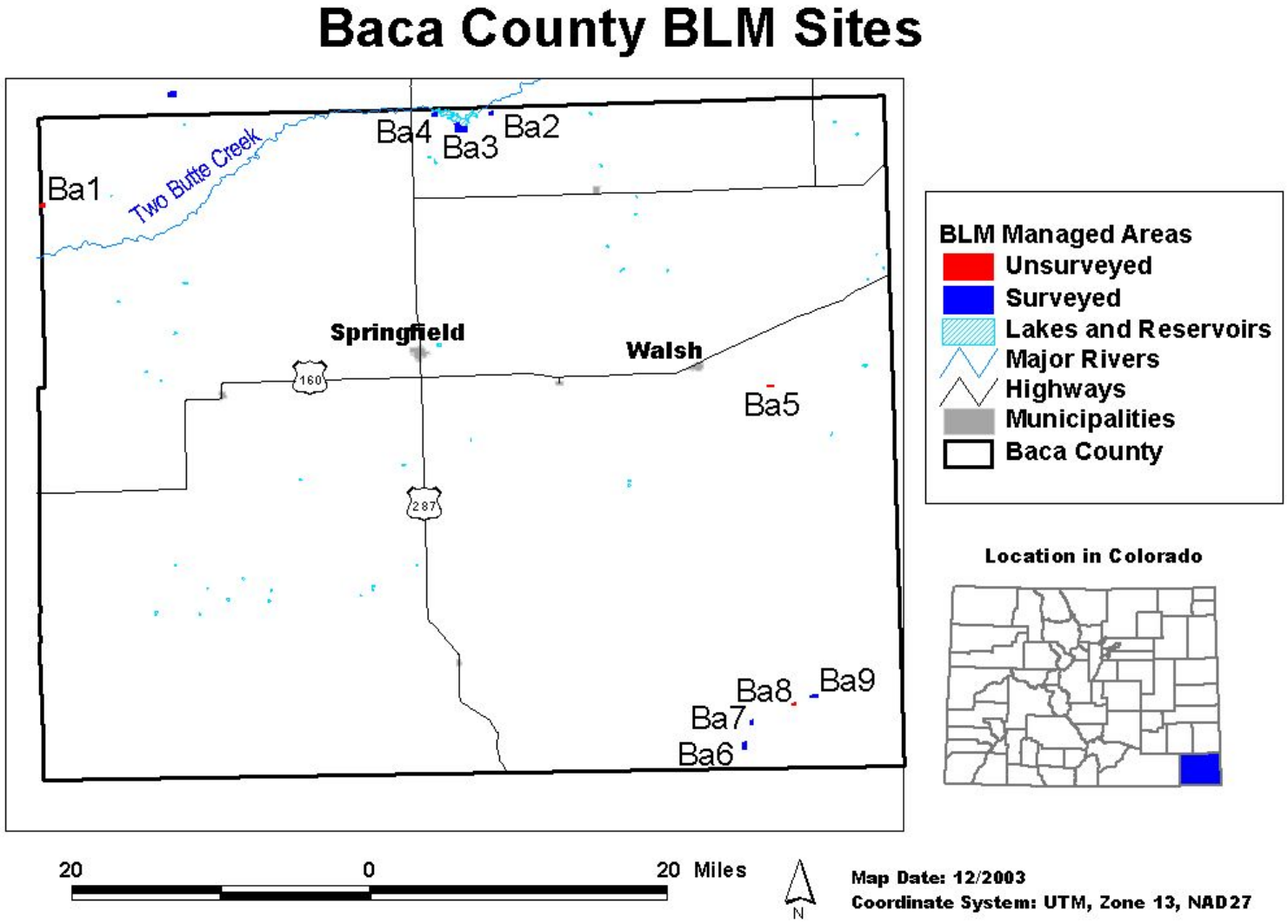

Fig. 8. Baca County and associated BLM field sites.

Bent County

There are 17 sites found throughout Bent County. All of these sites were visited in the field, but only one (site Be14) contains an active black-tailed prairie dog population, albeit a very small area.

Be1
This 397-acre parcel is located in north-central Bent County, approximately 4 miles north of John Martin Reservoir. Picture 120 corresponds to this site. The dominant vegetation is short-grass prairie composed of buffalograss, red-three awn and black grama. Rabbitbrush dominates the shrub layer, while woolly plantain and yellow goatsbeard make up the forb stratum. Loamy soils are found on the site, and the slope varies between 2-15% with the aspect trending southwest throughout. With the exception of the northern section of the site, where slopes are steeper, potential black-tailed prairie dog habitat at this site is excellent. Given the colony to the south, the likelihood that this parcel could support black-tailed prairie dog populations is high. However, it should be noted that the landowner has antagonistic views toward the species.

Be2
This 77-acre tract is located in north-central Bent County, approximately 6 miles north of John Martin Reservoir. The pictures of this parcel include 161 and 162. The site is characterized by short-grass prairie, mainly dominated by black grama, but also supporting stands of red-three awn and buffalograss. Shrub cover is quite dense in some areas, but generally sparse throughout. The dominant shrubs include snakeweed, sand sagebrush and yucca. Forb cover, dominated by Indian blanketflower, annual pricklypoppy and blackweed, is meager on the parcel. There is a southeast facing slope of 4-12%, with associated soils of sandy loam to loam. In areas of the site where slope and shrub cover are low, potential black-tailed prairie dog habitat is good. There is a fair likelihood that prairie dogs could inhabit the site in the future.

Be3
The Arkansas River bisects this 43-acre parcel located in western Bent County, approximately 5.5 miles west of the city of Las Animas. Permission to access this site could not be obtained, so a roadside survey was conducted. Highway 50 runs just 200 m south of the site. Picture 203 corresponds to this site (note: the picture is looking toward the site, but was not taken from the site). The site is characterized by riparian and associated upland vegetation. A mature cottonwood ribbon forest dominates the riparian zone, with cheatgrass and inland saltgrass dominating upland vegetation. The forb layer is primarily composed of kochia, Russian thistle and sunflower. It is important to note that no tamarisk was observed at the site. The site drains toward the stream channel on both sides, but trends to the east with a 0-2% slope. Soils are presumed to be sandy loam to loam. The majority of the site is not suitable for black-tailed prairie dogs, with only the edges representing marginal habitat (away from the river). The likelihood that this parcel will support prairie dogs in the future is likely to be low based on the small amount of area between the road, railroad and riparian zone.

Be4
This site is composed of two parcels that total 320-acres. The site is located in Adobe Creek Reservoir (Blue Lake) in northern Bent County, approximately 7 miles southeast of the town of

Arlington. Picture 120 corresponds to this site. This site is located in the southern end of the reservoir, which did not have much standing water in it at the time of the field visit, only moist areas. Due to this, there was vegetation encroachment into the drawdown zone of the reservoir and subsequent BLM land. The dominant species were tamarisk, sand sagebrush, alkali sacaton and Russian thistle. It should be noted that the riparian fringe of this reservoir is heavily infested with tamarisk (also see site K3). The site is flat with no aspect and has sandy loam soils. Potential black-tailed prairie dog habitat at this site is poor and the likelihood that this parcel would support prairie dog populations in the future is also poor. However, it should be noted that areas located away from the riparian fringe of the reservoir could be suitable potential black-tailed prairie dog habitat.

Be5

This site is composed of two parcels that total 216-acres and are located in northeast Bent County, approximately 6 miles north of John Martin Reservoir. Pictures numbered 117 and 118 correspond to the site. The eastern and larger portion of the site could not be accessed because permission was not granted to access that parcel. Short-grass prairie characterizes the vegetation of the western parcel dominated by buffalograss, red-three awn, side-oats grama and black grama. Associated shrubs and forbs include: prickly pear cactus (80%), snakeweed (20%), scarlet globemallow (60%) and bindweed (40%). There is a west facing slope of 4-6% with loamy soils. Potential black-tailed prairie dog habitat at this site is excellent and the likelihood that this parcel would support prairie dog populations in the future is good based on the close proximity of a colony. The eastern parcel is presumed to have similar vegetation, but has steeper slopes than the western parcel. It should be noted that the surrounding landowner has antagonistic views toward prairie dogs.

Be6

This site is composed of two irregularly shaped 68-acre parcels that are both bisected by the Arkansas River. The site is located in eastern Bent County, approximately five miles downstream of John Martin Reservoir. Pictures numbered 194 through 197 correspond to this site. The parcels are characterized by a riparian community that is dominated by tamarisk. Cottonwood is also present, but in far fewer numbers and little regeneration of this native species was observed. Moving away from the river, more shrubs, graminoids and forbs are found. Sand sagebrush, sand dropseed and blazingstar (*Nuttallia reverchonii*) dominate those layers respectively. Aspect varies on the parcels, but they general trend to the southeast with 0-4% associated slopes. Sand to sandy loam texture characterizes the soils of this site. Potential black-tailed prairie dog habitat at this site is poor and the likelihood that this parcel would support prairie dog populations in the future is also poor.

Be7

This 42-acre site is located in southcentral Bent County, with photos 217 and 218 depicting the site. The eastern edge of the site is differentiated by a canyon wall that is nearly vertical. There is some scattered juniper in the tallus at the base of the exposed rim rock. Soils are presumed to be shallow on top of the flat rim rock. The remainder and majority of the site is characterized by shortgrass prairie, dominated by buffalograss, sand dropseed and western wheatgrass. Approximately 30% of the site is covered by forbs. This layer is composed of Russian thistle, buffalobur, buffalogourd, and sunflower. Cholla and prickly pear cactus are also scattered

throughout the site. Slopes are minimal in this area characterized by loamy soils. Potential black-tailed prairie dog habitat on the western portion of this site is excellent and the likelihood that this parcel would support prairie dog populations in the future is very good based on the active prairie dog colony just 200 m to the northeast. The eastern side of the site is poor prairie dog habitat, however, the rock face looks to be excellent raptor habitat.

Be8

The 44-acre parcel is located in western Bent County, approximately 1.5 miles northwest of the Purgatoire River. Pictures 191-192 correspond to this site. Shortgrass prairie characterizes the site, dominated by buffalograss, blue grama and alkali sacaton. Cholla and prickly pear cactus are scattered throughout. Forbs are scarce at this site, with snow-on-the-mountain and hog potato (*Hoffmanseggia glauca*) the only two species at the site. It should be noted that *Hoffmanseggia glauca* is rarely collected (Weber 2001). Potential black-tailed prairie habitat is good at this site. However, the likelihood that this parcel will support prairie dog populations in the future is poor since there are no known colonies within 8 miles of the site.

Be9

This 144-acre parcel is located in western Bent County, approximately eight miles from the town of LaJunta. Pictures 189 and 190 correspond to the site. The plot is characterized by shortgrass prairie, dominated by western wheatgrass, blue grama, side-oats grama, red-three awn and galletagrass (*Hilaria jamesii*). Snakeweed and yucca dominate the shrubs, while scarlet globemallow is the major species found in the forb layer. There is a southeastern slope of 2-30%, which create small bluffs that divide the otherwise rolling site. Shallow, rocky clay soils are found in the parcel. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site. It is of interest to note that the landowner, Mr. Keo Honey, is interested in putting the surrounding land into a conservation easement.

Be10

This 18-acre site is located in southcentral Bent County, with photo number 226 depicting the site. The site is characterized by shrubland and shortgrass prairie, with a few juniper trees doting the landscape. Yucca, snakeweed, cholla and prickly pear cactus are found in the shrub layer, while the graminoid layer is composed of buffalograss, junegrass, and blue grama. There is a southeast slope of 4-20% with some exposed rock. The associated soils are a shallow, rocky, clay loam. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site. It should be noted that this site appears to be overgrazed.

Be11

This 82-acre site is located in southeastern Bent County, approximately 1.5 miles north of the Baca County line. Photo 227 and 228 correspond to this site. The site is dominated by shortgrass prairie, with limited shrub and juniper cover. Buffalograss, blue grama, side-oats grama and western wheatgrass form the graminoid layer, while yucca is the most prominent shrub. Heavily eroded draws dissect this site, forming fairly steep (6-45%) and rocky slopes, amongst the loamy soils. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

Be12
This 41-acre site is located in southeastern Bent County, with photos 229 and 230 depicting the site. Graminoids composed of buffalograss, ricegrass (*Oryzopsis spp.*), blue grama and red-three awn, and the shrubs yucca, sagebrush, snakeweed and prickly pear characterize the vegetation. A small, flat knob sits atop the site, with slopes of 2-15% running to the north/northwest. Potential black-tailed prairie dog habitat at this site is good, however, the likelihood of future prairie dog populations being supported on this site is poor since there are no colonies within five miles of the site.

Be13
This 63-acre site is located in southcentral Bent County, with photos 221-222 corresponding to the site. Shortgrass prairie characterizes the site. Little bluestem, buffalograss, blue grama and side-oats grama form the graminoid layer, while sand sagebrush dominates the shrub layer. Associated forbs include milkweed, slimflower scurfpea and thistle. Aspect at the site varies, but trends north with 6-50% slopes. The choppy landscape forms steep slopes with a gentle swale running through the central part of the site. The soils at the site are a clay loam, which are shallow and quite rocky in spots. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

Be14
This 20-acre site is located in southcentral Bent County, with photos 224-225 depicting to the site. There is abundant diversity of growth forms at this site with graminoids, forbs and shrubs all being equally represented. Buffalograss, red-three awn and blue grama comprise the graminoid layer; snakeweed, skunkbrush, yucca, prickly pear cactus and hedgehog cactus form the shrub layer; and scarlet globemallow and thistle dominates the forb stratum. The site sits toward the top of a ridge with 6-50% slopes leading into a draw to the south/southwest. The associated soils are clay loam, which are rocky and shallow. The soils at the site are a clay loam, which are shallow and quite rocky in spots. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

Be15
This 15-acre site is located in southcentral Bent County, with photos 231-232 corresponding to the site. The site is characterized by shrubland dominated by sagebrush, snakeweed, prickly pear cactus and cholla. The graminoid layer is dominated by buffalograss and snakeweed. There is a south facing slope of 2-10%, with rocky, clay loam soils. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

Be16
This 20-acre site is located in southeastern Bent County, approximately 2 miles west of the Prowers County line. Pictures 233 and 234 correspond to this site. The area is characterized by shortgrass prairie, with buffalograss, red-three awn and blue grama dominating the graminoid layer. There is limited shrub cover composed of sagebrush, cholla, yucca and prickly pear cactus. There is a northwest facing slope of 2-8% with loamy soils. Potential black-tailed prairie

dog habitat at this site is excellent. The likelihood that this site will support future prairie dog populations is fair, with the nearest known colony within three miles away.

Be17

This 88-acre site is located in northwestern Bent County in Horse Creek Reservoir. At the time of the field visit the site appeared to be inundated with water, as the parcel is located near the embankment structure. There does not appear to be any riparian area affiliated with this site. As a result potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site. There are no pictures that correspond to this portion of the site. There is an adjacent piece of BLM land on the west side of the reservoir in Otero County that was visited accidentally because it had already been catalogued in the 2002 report. Pictures 204 and 205 correspond to this piece of land. This site is dominated by cottonwood saplings and weedy forbs, as the area is most likely inundated during wet times of must years. Due to these factors, potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

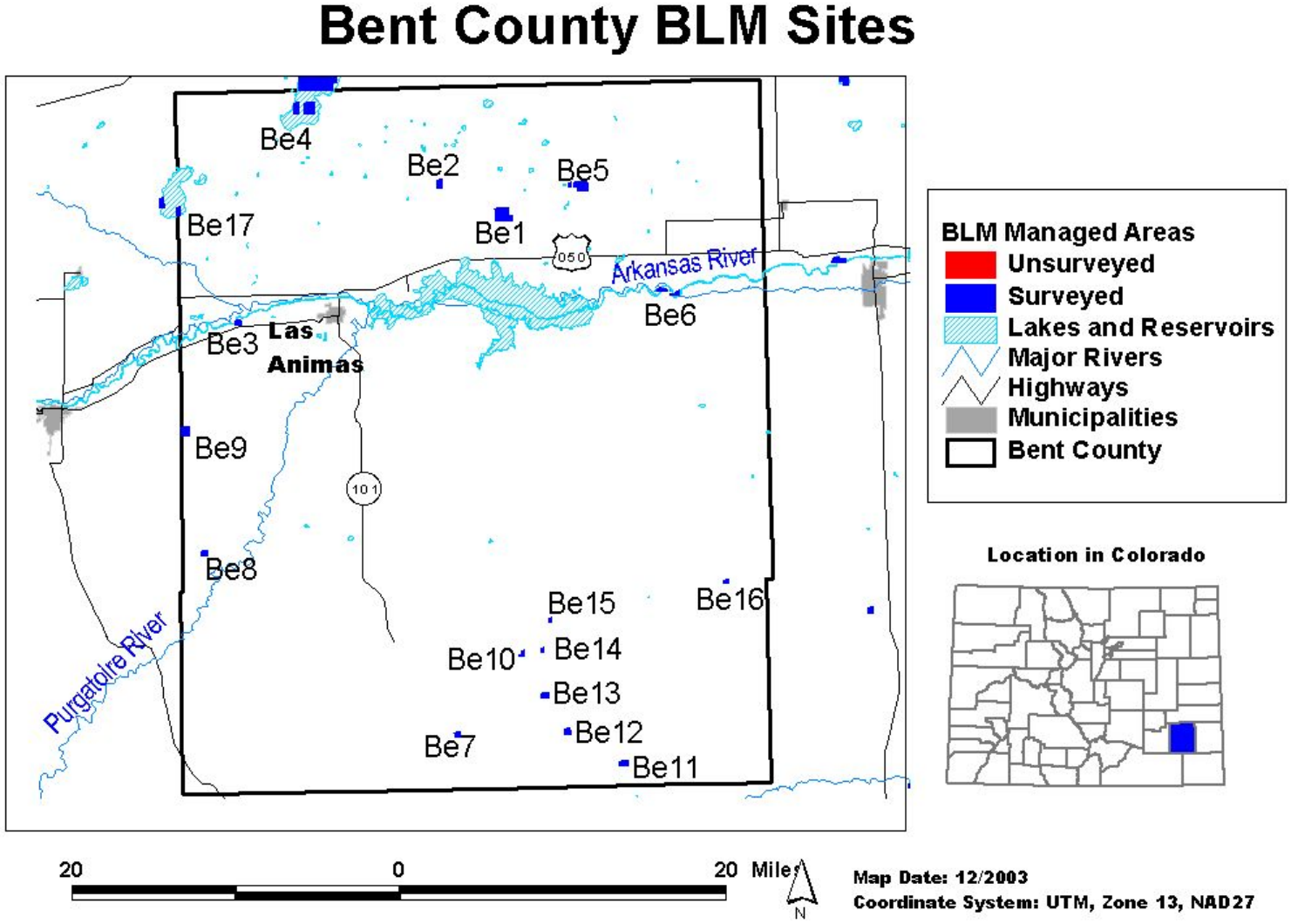

Fig. 9. Bent County and associated BLM field sites.

El Paso

There are four sites found in southeastern El Paso County. Three sites were visited, while access was denied to the final site. An active prairie dog colony persists on site E3.

E1

The landowner would not grant permission to access this 40-acre parcel in southeastern El Paso County. The landowner did grant access for two other parcels, but declined for this parcel given the number of cattle that were in the area. The parcel was located several miles from the nearest public road, so a roadside survey was not completed for this site. This site is located in an area with very sandy soils and dominated by sand sagebrush. There is reason to believe that the habitat suitability ranking for black-tailed prairie dogs at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site. No pictures exist for this parcel.

E2

This 81-acre parcel is located in southeastern El Paso County, with photos 55-56 depicting the site. The parcel is characterized by a sand sagebrush community, with prickly-pear scattered throughout. Forb cover accounts for 40% of the site, mostly sunflower and blackweed. Graminoid cover is very minimal (<1%) and is composed of buffalograss. There is a south/southwest slope of 2-10%, with sandy soils. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

E3

This 40-acre parcel is located in southeastern El Paso County, with photos 57 and 58 corresponding to the parcel. The site is characterized by shortgrass prairie, with buffalograss and scarlet globemallow dominating the vegetation. There is a west slope of 0-2%, with associated sandy loam to loamy soils. There is an active black-tailed prairie dog colony on site with a population of mountain plover. It should be noted that some of the burrows have been abandoned, but the population appears to be stable. Two adult plovers were seen foraging on site. Due to prairie dog and cattle grazing, some parts of the site are denuded of vegetation (30%). The habitat suitability ranking for prairie dogs as well as plover and burrowing owls is excellent. This site should continue to support populations of prairie dogs in the future provided a poisoning or plague event does not occur.

E4

This 35-acre site is located in eastern El Paso County, depicted by photos 163 and 164. The site is characterized by shortgrass prairie, with buffalograss (50%), red-three awn (25%), and western wheatgrass (25%) composing the graminoid layer. Forb cover and shrub cover are very limited with scarlet globemallow and prickly-pear cactus dominating those strata respectively. There is a southwest facing slope of 2-6% draining toward a dry wash that cuts through the southwest corner of the site. The site is characterized by loamy soils. Potential black-tailed prairie dog habitat at this site is excellent. The likelihood that this site will support future prairie dog populations is low, with no known active colonies anywhere in the vicinity of this site.

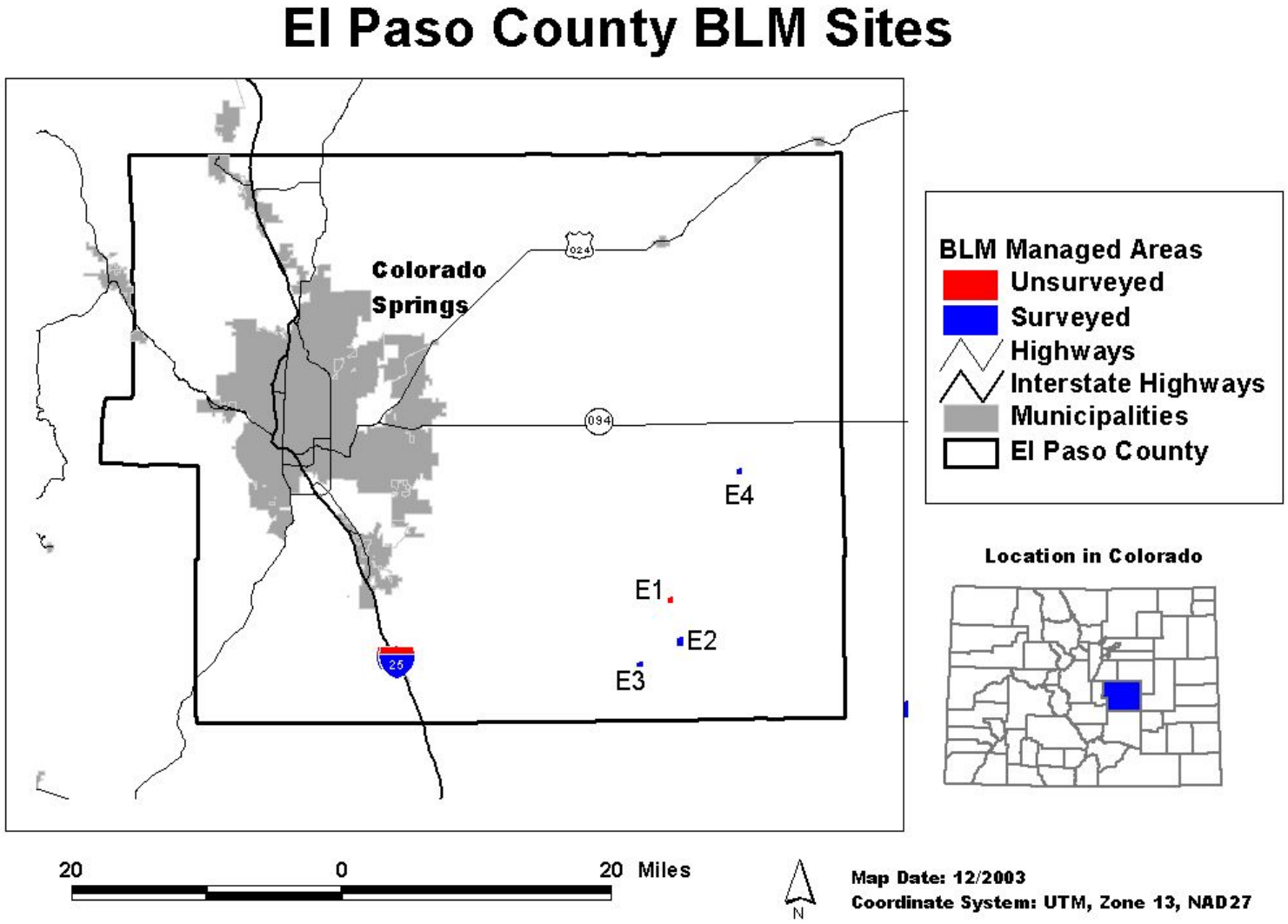

Fig. 10. El Paso County and associated BLM field sites.

Kiowa County

There are eight sites found in Kiowa County, including several large parcels around the group of reservoirs in the southern part of the county. All eight sites were visited in the field. A very large black-tailed prairie dog colony persists in and around site K4.

K1
This 157-acre parcel is located in western Kiowa County, depicted by photos 185 and 186. The site is characterized by shortgrass prairie, dominated by buffalograss (40%), alkali sacaton (40%) and blue grama (20%). Russian thistle and bitterweed dominate the forb layer, which accounts for 30% of the cover at the PCA. Prickly pear cactus is found throughout the site. There is a south facing slope of 2-4% with clay loam soils at the site. This area appears to have been hit hard by the drought, and the landowner confirmed this observation. Potential black-tailed prairie dog habitat at this site is good. The likelihood that this site could support future prairie dog populations is good, with the nearest known colony within 1.5 miles of the site.

K2
This 171-acre parcel is located in western Kiowa County, depicted by photos 183 and 184. The site is characterized by shortgrass prairie, dominated by buffalograss (30%), alkali sacaton (25%), blue grama (30%) and side-oats grama (15%). Buffalobur, bitterweed and scarlet globemallow dominate the forb layer, which accounts for 30% of the cover at the site. Prickly pear cactus is found throughout the site. There is a south facing slope of 2-4% with clay loam soils at the site. This area also appears to have been hit hard by the drought, and the landowner confirmed this observation. Potential black-tailed prairie dog habitat at this site is good. The likelihood that this site could support future prairie dog populations is fair, with the nearest known colony over four miles from the site.

K3
This 2000-acre parcel is located in western Kiowa County, depicted by photos 121 and 122. The site is located under the northern part of Adobe Creek Reservoir (Blue Lake), which contained water at the time of the field visit. The site may overlap onto some of the fringe riparian area that surrounds the reservoir depending on the amount of water in the basin. The riparian fringe is a monoculture of tamarisk on the bare sand. Each of the trees appears to be less than 1 m, so future management could be effective. There is no native vegetation to report from this site. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

K4
This 889-acre site is located in eastern Kiowa County, 2.5 miles south of the town of Brandon. Photos 106 and 107 correspond to the site. The site encompasses Chivington Reservoir Number 4, which is dry. According to the landowner, the reservoir has been dry for a very long time. Shortgrass prairie dominates the vegetation of the site. The graminoid layer is dominated by buffalograss, black grama, junegrass, and western wheatgrass. The forb layer is composed of scarlet globemallow, Indian blanketflower and slimflower scurfpea. Sand sagebrush dominates the shrub layer, while tamarisk is the only tree found on site. Stands of tamarisk form several sets of rings where the remnant shorelines of the reservoir had been. The aspect varies on this

large site, but mostly draining toward the basin of the old reservoir. Slopes are minimal at the site (2-4%) and loamy soils dominate. Black-tailed prairie dog habitat suitability at the site is excellent, as there is a large active colony on the south side of the site. A burrowing owl was observed on the colony, which is also excellent mountain plover habitat. The likelihood is good that this site will continue to support populations of such species, however, the landowner has antagonistic views toward prairie dogs and actively controls their populations.

K5

This 2200-acre parcel is located in southcentral Kiowa County, just east of U.S. Highway 287. Photo number 104 corresponds to the site. The parcel is inundated by Neenoshe Reservoir, which had a full capacity of water at the time of the field visit. There are some dead cottonwoods along the shoreline, which is otherwise dominated by rushes, tamarisk, Russian thistle and kochia. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site. Two large flocks (>50 individuals each) of American White Pelicans (*Pelecanus* erythrorhynchos) were observed on the reservoir.

K6

This 760-acre parcel is located in southcentral Kiowa County, just east of U.S. Highway 287. Photos 112-113 depict the site. Neeskah Reservoir inundates 70% of the parcel, with the remaining area occupying the part of the riparian fringe of the lake. This portion of the site is dominated by the graminoids western wheatgrass, alkali sacaton and the rush *Juncus arcticus ater*. There are small stands of cottonwood and tamarisk, and the forbs Indian blanketflower and slimflower scurfpea. The site has minimal slopes with sandy soils that drain into the basin. At the time of the field visit, the basin was full of water, with many dead fish along the sandy shoreline. There were dead stands of cottonwood and tamarisk throughout, but with regeneration of both species observed. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

K7

This 2040-acre parcel is located in southcentral Kiowa County, just west of U.S. Highway 287. Photos 114-115 depict the site. Neegronda Reservoir inundates 60% of the parcel, with the remaining area occupying the riparian fringe of the lake. This portion of the site is dominated by the forbs yellow sweetclover, white sweetclover and Russian thistle. There are small stands of cottonwood and tamarisk, with inland saltgrass found throughout. The site has minimal slopes with sandy soils that drain into the basin. The basin was full of water at the time of the field visit. There were dead stands of cottonwood and tamarisk throughout, but with regeneration of both species observed. The most conspicuous observation of the riparian zone is the dense stands of sweetclover found throughout. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

K8

This 200-acre parcel is located in southcentral Kiowa County, just west of U.S. Highway 287. Photo number 116 corresponds to the site. The parcel is completely inundated by Neesopah Reservoir, which had full capacity of water at the time of the field visit. The riparian fringe is dominated by graminoids, mostly rushes, with a stand of tamarisk on the west bank. Potential

black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

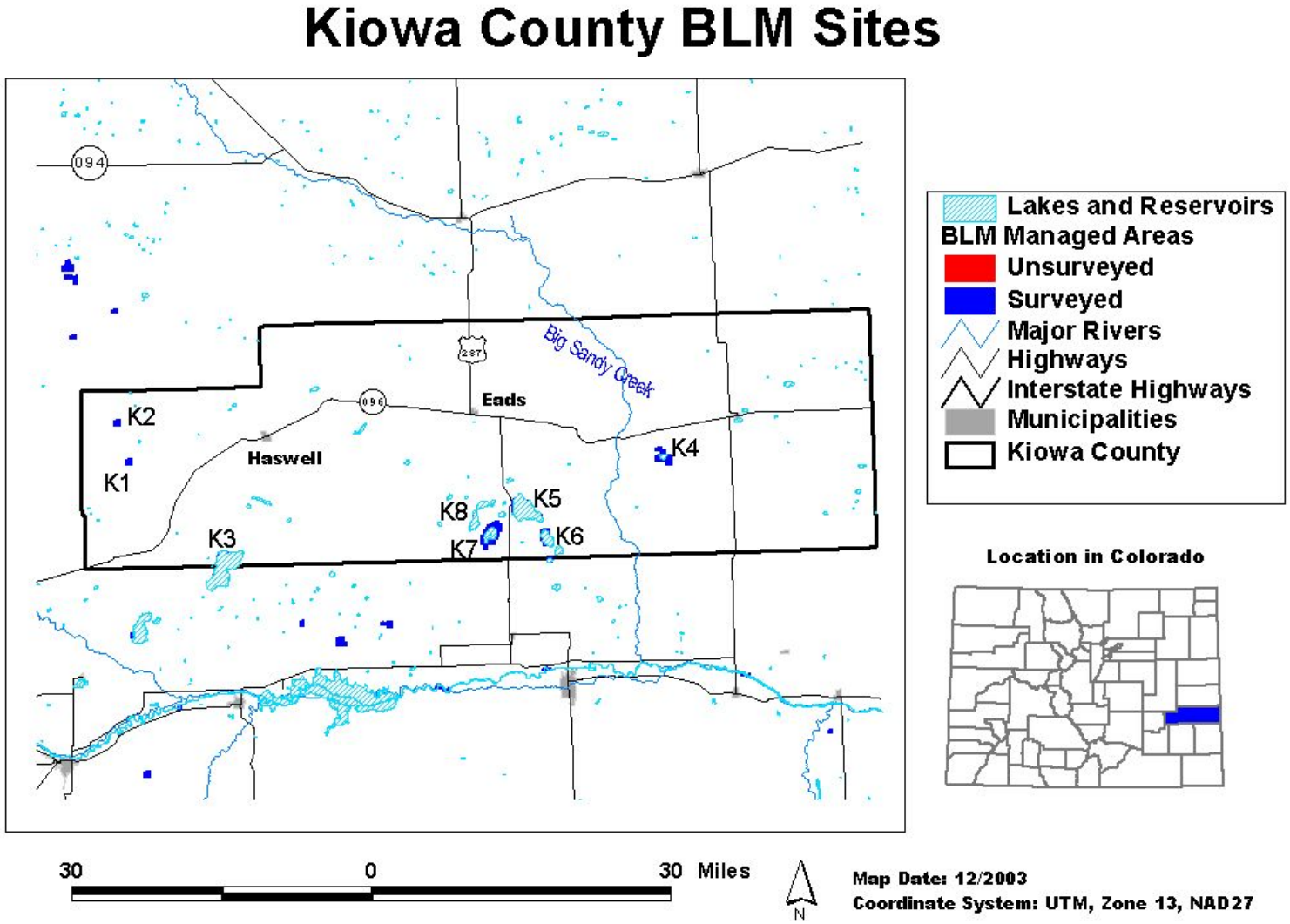

Fig. 11. Kiowa County and associated BLM field sites.

Las Animas County

Seventeen sites are found in the eastern part of this diverse, expansive county. Many of these parcels were found on the rugged Mesa de Maya and in the deep canyons that dissect the area. Permission was difficult to obtain, as several of the landowners dwell in surrounding states. As a result, permission was not obtained for three of the sites. Site La14 was not visited because it has been obtained from the BLM by the surrounding landowner. This was verified with both the landowner and BLM. The remaining 13 sites were visited in the field.

La1

The landowner would not grant permission to access this 46-acre parcel in northeastern Las Animas County. The parcel was located 0.25 mile from the nearest public road, so a roadside survey was completed for this parcel. Photo 124 depicts the site (note picture was taken approximately 0.25 mi away from the site). This site is located in an area where the landscape is broken by numerous canyons and small mesas. The site is predominantly pinyon pine and juniper with an understory of cholla, buffalograss and side-oats grama. There is a southeast facing slope of 6-20% with rocky soils. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

La2

This 480-acre site is located in western Las Animas County, approximately 12 miles northeast of Trinidad. Photos 59-61 correspond to the site. The site occupies portions of Model Reservoir and the surrounding riparian fringe. The reservoir lacked water except for a small stream running through the basin and exiting via the outflow channel. The vegetation at the site can by characterized as a forb dominated grassland, with Russian thistle and bindweed the major species. Pockets of greasewood exist in areas that are presumed to have a high salinity content. A few stands of cottonwoods persist around the remnant shore line, while foxtail barley and cheatgrass are found throughout. There is an east facing slope of just 0-2% with loamy soils present at the site. The habitat suitability ranking for black-tailed prairie dogs is fair on the areas outside of the basin that do not have tree cover. The likelihood that prairie dogs could occupy this area in the future is also fair. Although it is marginal habitat, an active colony persists to the southwest of the site.

La3

This 40-acre site is located in southcentral Las Animas County, approximately 17 miles from Trinidad. Pictures 64 and 65 correspond to the site. Shortgrass prairie characterizes the site, composed of western wheatgrass and foxtail barley. Greasewood dominates the shrub layer, while scarlet globemallow occupies the bulk of the forb strata. There is a small amount of cottonwood and Russian olive on site. There is an east facing slope that varies between 0-10%, with associated sandy loam soils. Potential black-tailed prairie dog habitat at this site is fair, although the likelihood of future prairie dog populations being supported on this site is poor since there are no colonies within the vicinity of the site.

La4

This 47-acre site is located in southcentral Las Animas County, approximately 17 miles east of Trinidad. Pictures 66 and 67 correspond to the site. Shortgrass prairie characterizes the site,

with the graminoid layer being composed of buffalograss, needle and thread, Indian ricegrass and galletagrass. Bitterbrush, yucca, greasewood and prickly pear cactus round out the shrub stratum, while scarlet globemallow dominates the forb layer. There is a southwest facing slope of 2-8% on the site, with clay loam soils. This site is excellent potential black-tailed prairie dog habitat, although the likelihood of future prairie dog populations being supported on this site is poor since there are no colonies within the vicinity of the site.

La5

The 121-acre site is located in central Las Animas County, approximately 3.5 miles northwest of the Purgatoire River. Pictures 206 and 207 portray the site. Juniper savanna with an associated understory of shortgrass prairie characterizes the site. Scattered juniper trees, buffalograss and bluegrama dominate the tree and graminoid layers respectively. Cholla, prickly pear, snakeweed and fringed sagebrush compose the shrub layer, while buffalobur and snow-on-the-mountain dominate the forb stratum. There is east/northeast facing slope of 0-10%, with associated clay loam soils and some areas of bare rock. This site represents fair potential black-tailed prairie dog habitat, although the likelihood of future prairie dog populations being supported on this site is poor since there are no colonies within the vicinity of the site.

La6

This 313-acre site is located in central Las Animas County, straddling the Purgatoire Canyon and river. Pictures 210 and 211 correspond to the site. Juniper woodland with an understory of shortgrass prairie characterizes the site. Juniper stands, blue grama and side-oats grama dominate the tree and graminoid layers respectively. The shrub layer is very diverse at this site containing cholla, skunkbrush, fringed sagebrush, prickly pear cactus, snakeweed, yucca and hedgehog cactus. The forb layer is limited to common sunflower, while 10% of the site is occupied by bare soil and rim rock. The aspect varies, but trends northeast with slopes ranging from 6-25%. The associated soils are clay loam, which is shallow and rocky throughout the site. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

La7

Permission to access this 41-acre site was not obtained, therefore the parcel was not visited. The parcel is located in central Las Animas County, bisected by Chacuaco Canyon. The dominant community of the site is presumed to be pinyon-juniper woodland. There is most likely exposed rim rock on the steep, rocky slopes of the canyon. Based on these factors, potential black-tailed prairie dog habitat at this site is poor and the likelihood that this parcel would support prairie dog populations in the future is also poor. There are no pictures of the site.

La8

This 124-acre site is located in southeastern Las Animas County, on the Mesa de Maya, approximately six miles from the New Mexico state line. Picture 213 corresponds to the site. The site is characterized by pinyon-juniper woodland, with an associated understory predominately composed of shrubs such as, oak, yucca, mountain mahogany, prickly pear and skunkbrush. Blue grama and side-oats grama dominate the graminoid layer. The aspect varies, but trends to the southeast with 6-20% slopes. Shallow, rocky clay loam soils are found on the site, which also contains some exposed rim rock. Potential black-tailed prairie dog habitat at this

site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

La9

Permission to access this site containing two 40-acre parcels (separated by 40-acres) was not obtained, therefore the parcel was not visited. The parcel is located in southeastern Las Animas County, on the Mesa de Maya, approximately four miles from the New Mexico state line. The dominant community of the site is presumed to be pinyon-juniper. The site is located in Spring Canyon, which has steep walls and presumably shallow, rocky soils. Based on these factors, potential black-tailed prairie dog habitat at this site is poor and the likelihood that this parcel would support prairie dog populations in the future is also poor. There are no pictures of the site.

La10

This 41-acre site is located in southeastern Las Animas County, on the Mesa de Maya, approximately four miles from the New Mexico state line. Pictures 237 and 238 depict the site. The site is characterized by juniper savanna, with an understory of shrubs and graminoids. Snakeweed, yucca, skunkbrush, cholla and prickly pear cactus compose the shrub layer, while blue grama, red-three awn, side-oats grama and western wheatgrass make up the graminoid stratum. Slimflower scurfpea and milkweed dominated the sparse coverage of the forb layer. The aspect varies, but trends southeast with 5-30% slopes that form a swale in the northeast portion of the site. Shallow, rocky clay loam soil is found on site. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

La11

This 84-acre site is located in southeastern Las Animas County, on the Mesa de Maya, approximately seven miles south of U.S. Highway 160. Pictures 235 and 236 correspond to the site. The site is characterized by pinyon-juniper stands and patches of shortgrass prairie. The graminoid layer is dominated by blue grama, red-three awn and black grama. Shrubs include snakeweed, cholla and prickly pear, while populations of bitterweed are the lone forb represented. There is a northeast facing slope of 2-20%, with shallow, rocky, clay loam soils. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

La12

The 42-acre site is located in southeastern Las Animas County, on the north slope of the Black Mesa, approximately 0.5 miles south of West Carrizo Creek. Picture 214 corresponds to the site. The parcel is characterized by pinyon-juniper communities throughout the mesa. Numerous graminoids are found at the site including black grama, side-oats grama, little bluestem and blue grama. Associated shrubs are mountain mahogany, oak, cholla and prickly pear, while milkweed, gayfeather and verbena round out the forb layer. The aspect varies, but trends east with slopes of 5-40%. There are very shallow associated clay soils with the site, and exposed rim rock throughout, as this site is located in canyon country. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site. According to the surrounding landowner, a fire swept through this area in

the summer of 2002. This was confirmed upon completion of the field visit, but the fire did not reach as far north as the BLM land.

La13
This 40-acre site is located in southeastern Las Animas County, on the Black Mesa, approximately 0.5 miles south of Furnish Canyon. Picture 216 depicts this site. Juniper savanna characterizes the vegetation of the site, with side-oats grama and blue grama dominating the prominent graminoid layer. Cholla, yucca, snakeweed and prickly pear cactus compose the shrub stratum. There is a south facing slope of 2-10%, with shallow, rocky, clay loam soils present at the site. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

La14
This 52-acre site located in northeastern Las Animas County had been disposed of to private ownership prior to this project. Therefore the site was not visited. Both the landowner and the BLM confirmed this transaction.

La15
The landowner would not grant permission to access this 49-acre parcel, located in northeastern Las Animas County. The parcel is located ¼ mile from the nearest public road, so a roadside survey was completed for this parcel. Picture 146 depicts the parcel. This site is located in an area with loamy soils and dominated by western wheatgrass. The dominant graminoid layer at the site is peculiar because it almost appears to have been planted if and when the area was taken out of agricultural production. There is an east facing slope of 0-2%. There is reason to believe that the habitat suitability ranking for black-tailed prairie dogs at this site is good. There is a known colony, approximately three miles southwest of the site. However, the likelihood of future prairie dog populations being supported on this site is low because the landowner is extremely antagonistic toward the species.

La16
This 40-acre parcel is located in southeastern Las Animas County on the southwest slope of the Mesa de Maya. Picture 212 corresponds to the site. The parcel is characterized by pinyon-juniper communities with graminoids such as, blue grama, Indian ricegrass and western wheatgrass, dominating the understory. Forb cover, composed of snow-on-the-mountain, sunflower and buffalobur, and shrub cover, dominated by snakeweed and cholla, are limited at the site. There is a south facing slope of 6-30%, with a rocky, clay loam substrate present at the site. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

La17
Permission to access this 38-acre site was not obtained, therefore the parcel was not visited. The parcel is located in southcentral Las Animas County, on the western slope of the Mesa de Maya. The dominant community of the site is presumed to be juniper savanna. There is most likely rocky slopes with shallow soils present at the site. Based on these factors, potential black-tailed prairie dog habitat at this site is poor and the likelihood that this parcel would support prairie dog populations in the future is also poor. There are no pictures of the site.

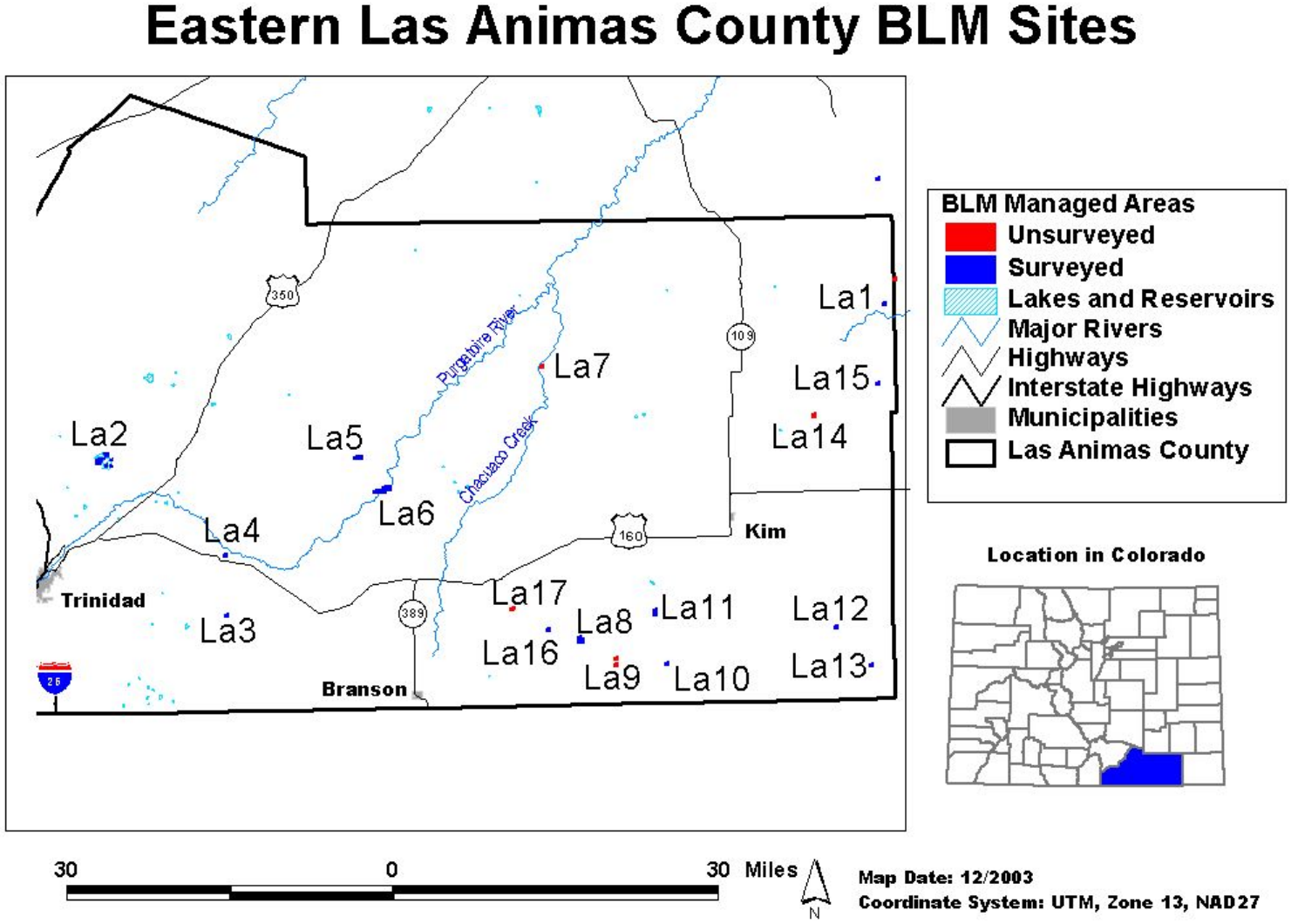

Fig. 12. Las Animas County and associated BLM field sites.

Lincoln County

There are 13 sites found in the south of Interstate 70, and one site found in the extreme northeast corner of the county. Access was denied to one site, while the remaining 13 sites were visited in the field. Populations of black-tailed prairie dogs are found on three of the sites.

Li1

This 64-acre site is located in northern Lincoln County, just one mile south of the Washington County line. Depicted by pictures 71 and 72, it is the only site in Lincoln County to be found in the northern study area. Shortgrass prairie characterizes the vegetation, dominated by the graminoids, buffalograss, junegrass and red-three awn. Shrubs of prickly pear and fringed sagebrush, and the forbs slimflower scurfpea and scarlet globemallow are found scattered throughout the site. There is an east facing slope of 2-8%, with associated clay loam soils. Potential black-tailed prairie dog habitat at this site is excellent, while the likelihood of future prairie dog populations being supported on this site is fair. The nearest known, active colony is five miles to the northeast, across the channel of the North Fork of the Arikaree River.

Li2

This 193-acre parcel is located in southcentral Lincoln County, approximately two miles south of the town of Karval. Pictures 31 and 32 correspond to the site. The vegetation of the site is short-grass prairie, with minimal shrub and tree cover. There is a small reservoir in the central portion of the site that had a full capacity of water at the time of the field visit. A lone cottonwood and discarded machine parts occupied the south bank of the reservoir. Buffalograss, red-three awn, foxtail barley and galletagrass compose the graminoid layer, while scarlet globemallow dominates the forb stratum. Very limited amount of yucca, prickly pear and sand sagebrush are found throughout the site. There is a southeast facing slope of 2-8%, with clay loam soils. Potential black-tailed prairie dog habitat at this site is excellent, as well as the likelihood of future prairie dog populations being supported on this site. There is a known, active colony 200 m north of the site that could expand onto the BLM land in the near future.

Li3

This 256-acre parcel is located in southcentral Lincoln County, approximately 2.5 miles south of the town of Karval. Pictures 169 and 170 depict the site. The western edge of this site adjoins site Li2, and is very similar in vegetative composition. Buffalograss, black grama, side-oats grama and red-three awn dominate the graminoids, while slimflower scurfpea, sunflower, Russian thistle and scarlet globemallow dominate the forb layer. Prickly pear cactus and snakeweed dominate the sparse shrub layer. The presence of ruderal forbs and the visual appearance of the site might indicate overgrazing has taken place. There is a south/southwest facing slope of 0-30% on this rolling site. The southern part of the site has steeper slopes and sandy loam soils and represents fair black-tailed prairie dog habitat. The northern part of the site has minimal slopes with loamy soils. A known, active prairie dog colony extends into the northern section of this site, which represents excellent habitat. The likelihood that this colony could extend further into this site, where habitat is most preferable, is very likely in the near future.

Li4
This 123-acre parcel is located in southcentral Lincoln County, approximately three miles south of the town of Karval. Pictures 33 and 34 correspond to the site. The site is characterized by shortgrass prairie with some scattered yucca and prickly pear cactus. Buffalograss dominates the graminoids, which also is composed of bluegrama, galletagrass, and red-three awn. Scarlet globemallow dominates the sparse forb layer. There is an east facing slope of 6-8%, with an underlying clay loam soil. Based on these factors, the habitat suitability ranking is good. The closest known active colony is at least 1.5 miles away from this site. Therefore the likelihood that this site will inhabited by prairie dogs in the future is fair to poor.

Li5
This 126-acre parcel is located in southcentral Lincoln County, approximately three miles south of the town of Karval. Pictures 171 and 172 correspond to the site. The site is characterized by shortgrass prairie with some scattered yucca and prickly pear cactus. Buffalograss dominates the graminoids, which also is composed of sideoats grama and red-three awn. Slimflower scurfpea and scarlet globemallow dominate the sparse forb layer. There is a south facing slope of that varies between 2-10%, with an underlying soil of sandy loam. Based on these factors, the habitat suitability ranking is good in areas with minimal slope. The closest known active colony is at least 1.5 miles away from this site. Therefore the likelihood that this site will be inhabited by prairie dogs in the future is fair to poor.

Li6
This 80-acre site is located in southcentral Lincoln County, approximately eight miles southeast of the town of Karval. Pictures 177-178 depict the site. The site is characterized by shortgrass prairie, with limited yucca and prickly pear cover. The dominant graminoid layer is composed of buffalograss, blue grama, red three-awn and sideoats grama. The forb layer is dominated by bitterweed. There is an east facing slope of 0-8% with sandy loam soils. The habitat suitability ranking of this site is excellent for prairie dogs. There is a known active colony within 0.25 miles of this site, therefore, the likelihood that this site could support black-tailed prairie dog populations in the future is excellent. A swift fox was observed on the site, while burrowing owls were recorded on the nearby prairie dog colony.

Li7
This 82-acre site is located in southcentral Lincoln County, approximately nine miles south of the town of Karval. Pictures 53 and 54 correspond to the shrubland dominated site. Yucca and sand sagebrush dominate the area, with an associated understory of buffalograss, bluegrama and scarlet globemallow. There is a north facing slope of 6-15% with loamy sand soils. A gentle swale in the middle of the site drains toward a small reservoir just north of the site. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

Li8
This site consists of two separate parcels located 3.5 miles apart in southern Lincoln County. The north parcel (pictures 36-37) is 80-acres in size, while the southern parcel (pictures 38-39) is 120-acres. These sites were grouped together because they are owned by the same organization (Horse Creek Grazing Association) and are similar in composition. The graminoid layer

dominates the areas and is composed of buffalograss, blue grama and galletagrass. Scarlet globemallow and wholly plantain are found in the sparse forb layer. Bare soil is found on approximately 15% of each site, and there is good indication that this site has been overgrazed. The north parcel has a west facing slope, while the south parcel has an eastern aspect. Both sites have 2-6% slopes with associated clay loams. Potential black-tailed prairie dog habitat is excellent at the site. However, the likelihood that populations will exist here in the future is fair to poor, as the closest active colonies are over three miles away.

Li9

This 65-acre site is located in southern Lincoln County and is depicted by photos 187 and 188. The site is characterized by shortgrass prairie, and dominated by the graminoids buffalograss, black grama, and red-threeawn. Forbs such as slimflower scurfpea, Russian thistle and scarlet globemallow are found throughout, along with prickly pear cactus. There is a southwest slope of 0-2% with associated loamy sand soils. Based on these factors, the habitat suitability ranking for black-tailed prairie dogs at this site is good. The likelihood that this site could support populations of prairie dogs in the future is fair to poor because no known colonies exist within dispersal distance of the site.

Li10

This 41-acre parcel is located in southwestern Lincoln County and is depicted by photos 40-42. The site is a mixture of shortgrass prairie, riparian and shrubland. Cottonwoods line the dry stream channel of Dead Horse Creek. The dominant graminoid layer is composed of buffalograss, junegrass and needle and thread. Sand sagebrush, prickly pear, yucca and cholla comprise the shrub layer, while scarlet globemallow dominates the forb layer. There is a south facing slope of 0-4%, with sandy soils found in the dry wash floodplain. Based on these factors, potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

Li11

This site contains two 40-acre parcels, approximately one mile apart, located in southwestern Lincoln County. The north parcel is depicted in photos 43-44, while the south parcel corresponds to photos 45 and 46. Shortgrass prairie dominates the site with some sparse shrub cover throughout. The dominant graminoid layer is composed of buffalograss, blue grama, red three-awn and galletagrass. Sand sagebrush, prickly pear, yucca and cholla comprise the shrub layer, while scarlet globemallow and slimflower scrufpea dominate the forb layer. There is an east facing slope of 2-10%, with associated silt loam soils. Based on these factors, the habitat suitability ranking for black-tailed prairie dogs at this site is good. The likelihood that this site could support populations of prairie dogs in the future is fair because no known colonies exist within dispersal distance of the site.

Li12

This 327-acre site is located in southwestern Lincoln County, depicted by photos 48 and 49. Graminoids composed of buffalograss, red three-awn and galletagrass dominate the site. Yucca, sand sagebrush, prickly pear cactus, scarlet globemallow and slimflower scurfpea are found throughout the fairly sparse shrub and forb layers. There is a southwest facing slope of 2-8% with associated sandy loam soils. This site represents excellent habitat for black-tailed prairie

dogs as there is an active colony found on site. The surrounding landowner has antagonistic views toward the species, but the likelihood that this colony will persist is good due to the large size of the colony. Mountain plover and burrowing owls were also observed just near the site.

Li13

This 36-acre site is located in southern Lincoln County and corresponds to photos 165-167. Buffalograss, black grama, and galletagrass compose the dominant graminoid layer. Prickly pear cactus, scarlet globemallow and wholly plantain dominate the sparse shrub and forb layers. There is a northwest slope of 0-4% with loamy soils. Black-tailed prairie dog habitat at the site is excellent, as there is an active colony that extends onto the southern portion of the parcel. A burrowing owl was also observed on the site. The likelihood that this colony will persist at this location is good. The surrounding landowner has not poisoned prairie dogs on her land in over 10 years. She appears to be tolerant of colonies that are fairly small in size.

Li14

The landowner would not grant permission to access this 39-acre parcel in western Lincoln County, just 0.5 miles south of the Elbert County line. The parcel is not located within sight of a public road, so a roadside survey could not be completed. The parcel is located in the Horse Creek valley, with steep slopes just to the northeast of the parcel. The vegetation is presumed to be shortgrass prairie, as Horse Creek does not run often enough to support a sizeable riparian zone. Based on these factors, the habitat suitability ranking for black-tailed prairie dogs at this site is good. The likelihood that this site could support populations of prairie dogs in the future is fair because no known colonies exist within dispersal distance of the site. No pictures exist for this parcel.

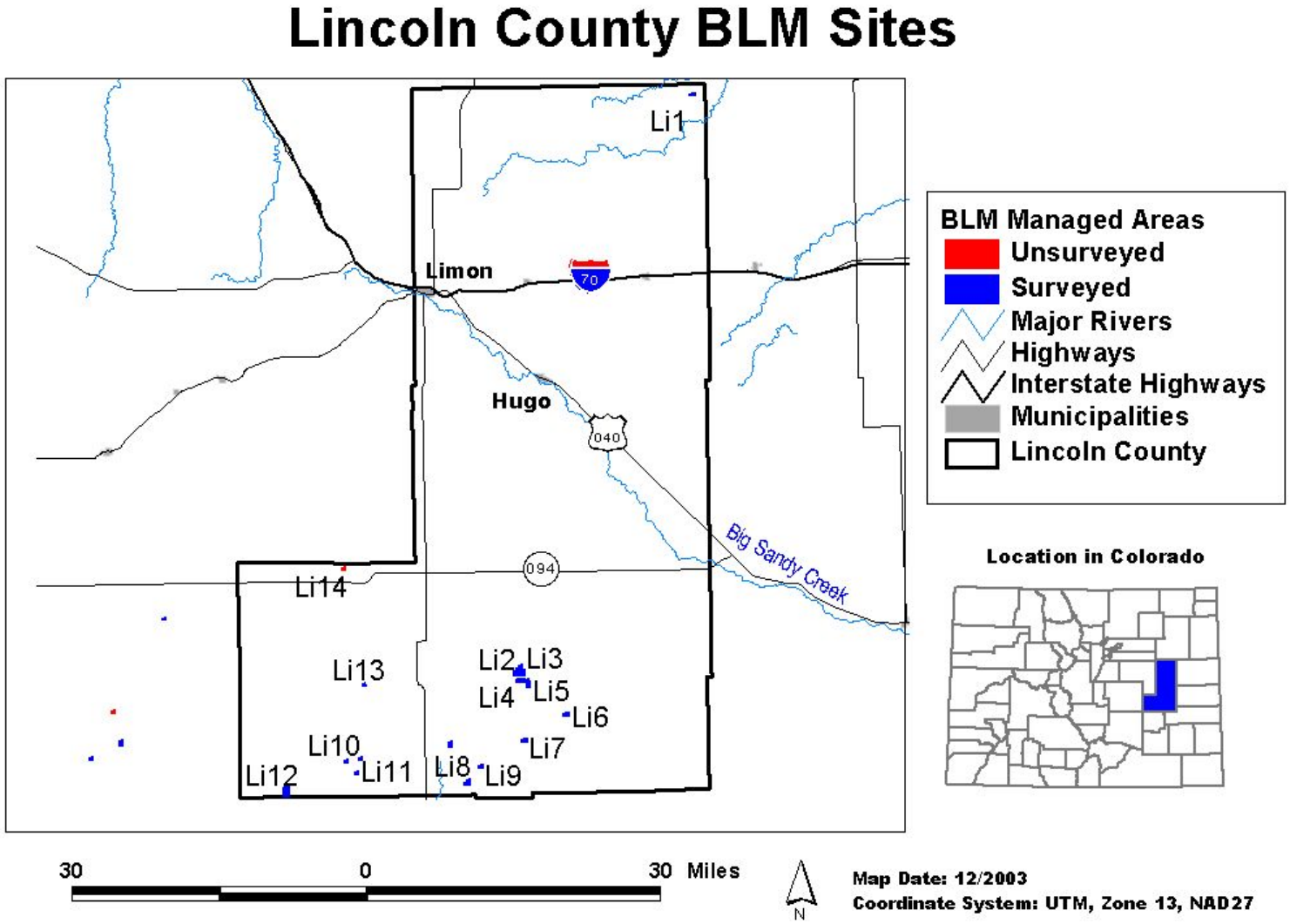

Fig. 13. Lincoln County and associated BLM field sites.

Logan County

There is only one site located in Logan County, southeast of Sterling, Colorado. This site was visited in the field and appropriately documented.

Lo1

This 43-acre parcel is located along the South Platte River in southwestern Logan County, approximately five miles south of Sterling. Picture number 10 corresponds to the site. Large cottonwoods are found along the river, but the majority of the site is covered with weedy forb species. Kochia and Russian thistle dominate the forb layer. Slopes at the site are minimal with a sandy substrate. Agricultural lands surround the site to the south. Based on these factors, potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

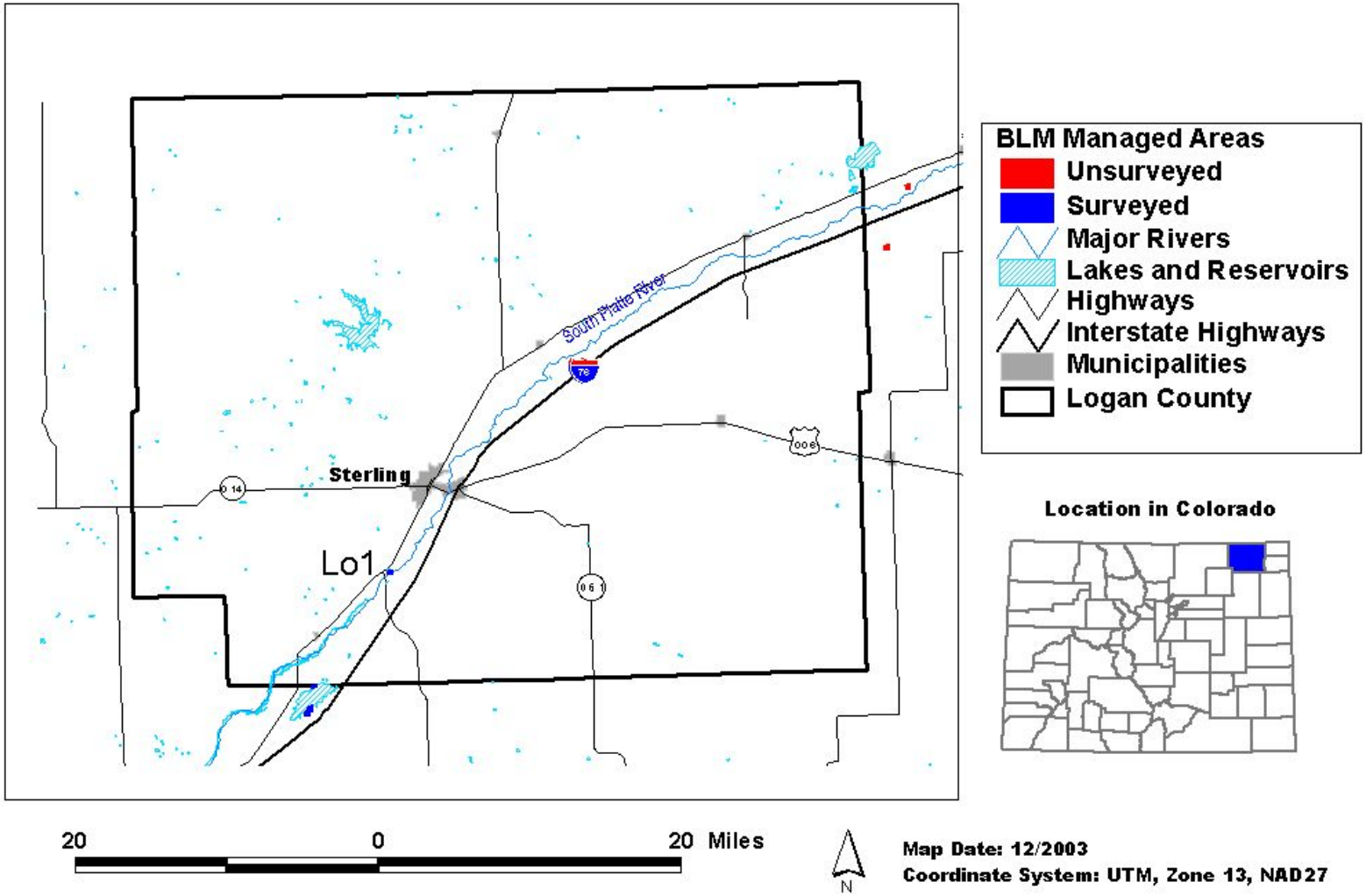

Fig. 14. Logan County and associated BLM field sites.

Morgan County

Five sites are located in Morgan County, and all sites were visited in the field. There are no black-tailed prairie dog colonies on BLM sites in this county.

M1
This 48-acre parcel is located in northeastern Morgan County, on a terrace just south of the South Platte River. Photos 22 and 23 correspond to this site, which is characterized by short-grass prairie. Buffalograss, needle and thread and junegrass dominate the site, with scattered sand sagebrush and prickly pear cactus. There is a south facing slope of 2-6% with soils varying from sand to sandy loam. The habitat suitability ranking for black-tailed prairie dogs at this site is fair. The likelihood that this site could support populations of prairie dogs in the future is poor because no known colonies exist within dispersal distance of the site.

M2
This 37-acre site is located in northern Morgan County, approximately 14 miles north of Fort Morgan. Photos 20 and 21 depict the mixed site of short-grass prairie and shrubland. Blue grama and cheatgrass dominate the graminoids, while sand sagebrush, yucca and prickly pear cactus are found in the shrub layer. There is a swale that runs through the middle of the site with minimal slopes that face the southeast. Steeper slopes of 10-12% flank each side of the swale, leading up to areas of exposed rock. Loamy soils are found in the middle of the swale. The habitat suitability ranking for black-tailed prairie dogs at this site is fair (good in the swale, poor outside of it). The likelihood that this site could support populations of prairie dogs in the future is poor because no known colonies exist within dispersal distance of the site.

M3
This 91-acre site is located in northern Morgan County, approximately eight miles north of Fort Morgan. Photos 15-17 depict the mixed site of short-grass prairie and shrubland. Cheatgrass, needle and thread and junegrass dominate the graminoid stratum, while yucca, prickly pear, penstemon, and Russian Thistle make up the shrub and forb layers respectively. There is a small canyon running through the site with a north facing slope of 10-20%. Within the canyon lies some exposed sandstone, with loamy soils above. The habitat suitability ranking for black-tailed prairie dogs at this site is poor, as well as the likelihood that this site could support populations of prairie dogs in the future.

M4
This site contains two parcels that are located within two miles of each other in northern Morgan County. The west parcel (pictures 12-14) is 80-acres in size, while the east parcel (pictures 18-19) is 80-acres. Graminoids of cheatgrass, needle and thread, junegrass and buffalograss dominate the site. Associated shrubs include yucca, prickly pear and snakeweed, while the forbs penstemon and lupine are found sparingly throughout. Two separate escarpments and associated canyons bisect each site, resulting in northeasterly slopes of 5-12%. There is some exposed rock associated with the canyons, but the soils are generally a loam throughout. The habitat suitability ranking for black-tailed prairie dogs at this site is fair, although the limited area above the escarpments represents good habitat. The likelihood that the western parcel will support populations of prairie dogs in the future is poor, while the likelihood of the eastern parcel is fair.

A known active colony is located approximately two miles east of the eastern parcel. However, a major highway, dry stream channel and varied topography separate the colony from the parcel.

M5

This site contains two parcels located in and around Bijou Number 2 Reservoir. The northern parcel (pictures 95-96) is 120-acres, while the southern parcel (pictures 93-94) is 160-acres in size. At the time of the field visit, there was water in the reservoir. However, according to Steve Smith, land manager of the adjoining property, the reservoir had been dry for several preceding years. As a result many weeds can be found on the reservoir floor in dry years. A few scattered cottonwoods were observed along the reservoir banks, interspersed with rip-rap. Only a small portion of these parcels are located outside of the reservoir and were dominated by the shrubs sand sagebrush and prickly pear. Many ruderal species were observed on the site such as cheatgrass, annual prickle poppy, Russian Thistle and perennial pepperweed. Native graminoids such as western wheatgrass, junegrass, needle and thread and Indian ricegrass were found sparingly throughout the site. The habitat suitability ranking for black-tailed prairie dogs at this site is poor, as well as the likelihood that this site could support populations of prairie dogs in the future.

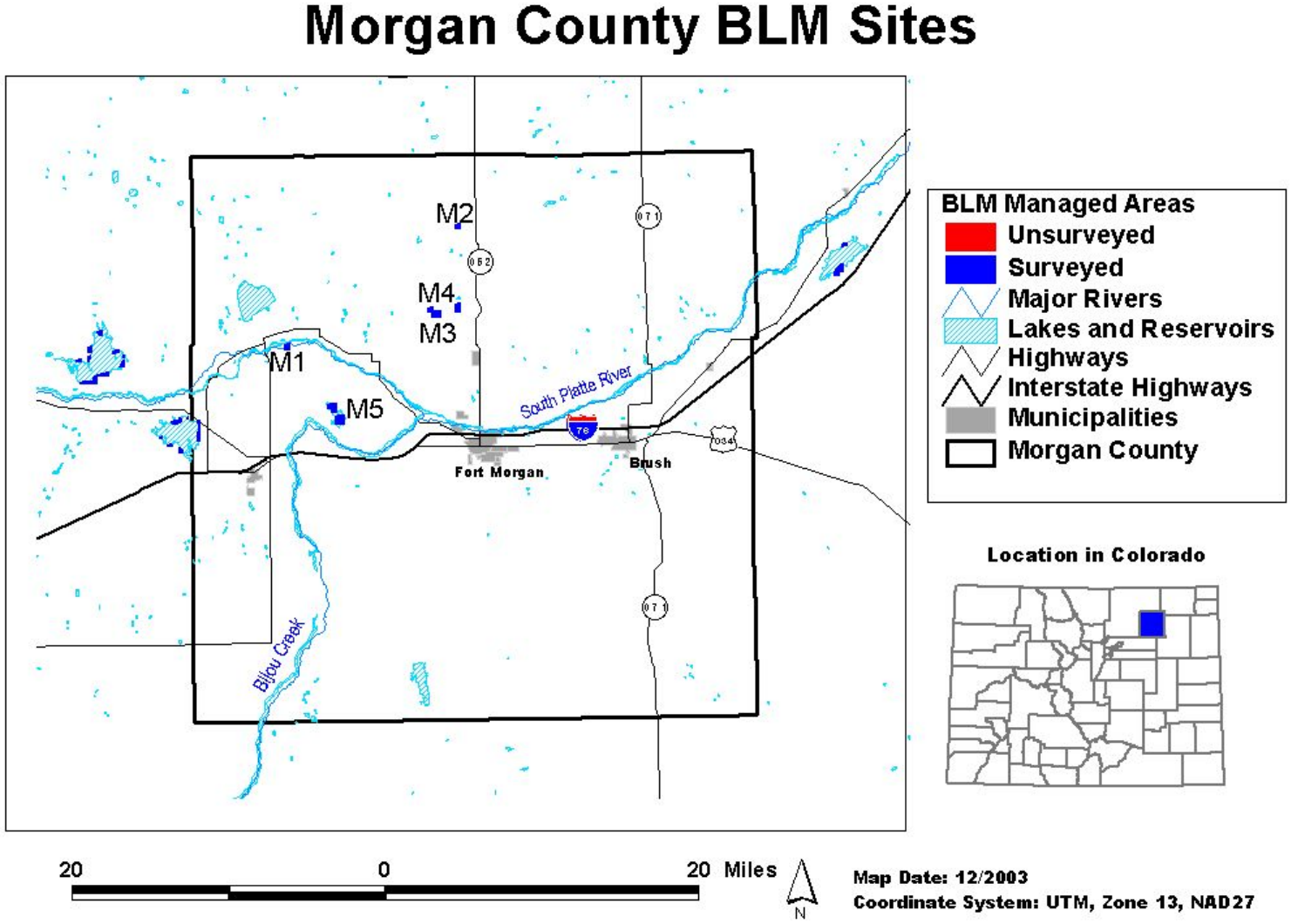

Fig. 15. Morgan County and associated BLM field sites.

Prowers County

There are six sites located in Prowers County, with three of them along the Arkansas River. All six were visited in the field and there were no black-tailed prairie dog colonies found on any of the sites.

Pr1
The 103-acre site is located in western Prowers County, approximately two miles upstream of Lamar. The site is bisected by the Arkansas River and characterized by a riparian community dominated by dense tamarisk, cottonwood and Russian olive. Western wheatgrass, alkali sacaton, rye, reed canary grass and rushes comprise the graminoid layer. Ruderal forbs such as common sunflower, Russian thistle and Kochia can be found on site. There is an east facing slope of 0-2% with sand to sandy loam soils. The site is completely choked by tamarisk in some areas, making river access difficult. The habitat suitability ranking for black-tailed prairie dogs at this site is poor, although adjacent upland areas might provide good habitat. The likelihood that this site could support populations of prairie dogs in the future is also poor.

Pr2
This site consists of two 78-acre parcels bisected by the Arkansas River and located within 0.5 miles of each other. Pictures 198 and 199 depict the dense riparian site dominated by tamarisk, with a few cottonwoods. Alkali sacaton, sand dropseed and cheatgrass can be found in the graminoid layer along with the ruderal forbs common sunflower, Russian Thistle and kochia. There is a minimal slope which trends to the southeast, and sandy loam soils. Cottonwood regeneration was almost non-existent at the site, which stands to be a management concern. The habitat suitability ranking for black-tailed prairie dogs at this site is poor, although the site provides good cover for many avian species. The likelihood that this site could support populations of prairie dogs in the future is also poor.

Pr3
This 43-acre site is located in southern Prowers County, approximately three miles south of the town of Holly. Pictures 200 and 201 depict the sand shrubland dominated site. Yucca, needle and thread and common sunflower are also found at this low diversity site. There is a north/northwest slope of 4-10% with sandy soils. The habitat suitability ranking for black-tailed prairie dogs at this site is poor, as well as the likelihood that this site could support populations of prairie dogs in the future.

Pr4
This 83-acre site is located in southwestern Prowers County, approximately two miles east of Highway 287. Pictures 127 and 128 depict the shortgrass prairie site. Buffalograss, blue grama and red three-awn dominate the graminoid layer. Snakeweed, yucca, and prickly pear are found in the shrub stratum of the site, along with the forbs slimflower scurfpea, Indian blanketflower and bitterweed. There is a northeast facing slope of 4-10%, with associated clay loam soils. The habitat suitability ranking for black-tailed prairie dogs at this site is good, although part of the site has fairly steep slopes. The likelihood that this site could support populations of prairie dogs in the future is fair, as there is a known active colony two miles to the southeast. Habitat

between these two areas appears to be preferential to black-tailed prairie dogs, so expansion and subsequent dispersal could eventually reach the site.

Pr5

The 38-acre site is located in southwestern Prowers County, approximately one mile west of Highway 287. The shortgrass prairie site is depicted by picture 130. Buffalograss, blue grama, slimflower scurfpea and bindweed dominated the herbaceous layers, while Yucca, cholla and prickly pear are found in the shrub layer. There is a south/southwest facing slope of 2-6%, with associated clay loam soil. The habitat suitability ranking for black-tailed prairie dogs at this site is good, while the likelihood that this site could support populations of prairie dogs in the future is fair. There is a known active colony one mile to the east, although U.S. Highway 287 separates these two areas and probably contributes to mortality of this population. As a result, westward expansion of the colony toward the site is presumed to be limited.

Pr6

This 120-acre site is located in northwest Prowers County, along the Kiowa County line. Pictures 99 and 100 correspond to this site dominated by open water and riparian fringe. There was a small amount of standing water in King Reservoir at the time of the field visit and the riparian fringe was very moist. The vegetation at the site exclusively consists of the graminoids, foxtail barley, alkali sacaton, cheatgrass and rushes. A very gentle slope drains toward the reservoir and the soils are a clay loam. The habitat suitability ranking for black-tailed prairie dogs at this site is poor, as well as the likelihood that this site could support populations of prairie dogs in the future. However, there is a large, active colony just east of the site. It is possible that prairie dogs might inhabit the very edge of the site, if the colony were to expand to the xeric vegetation just offsite.

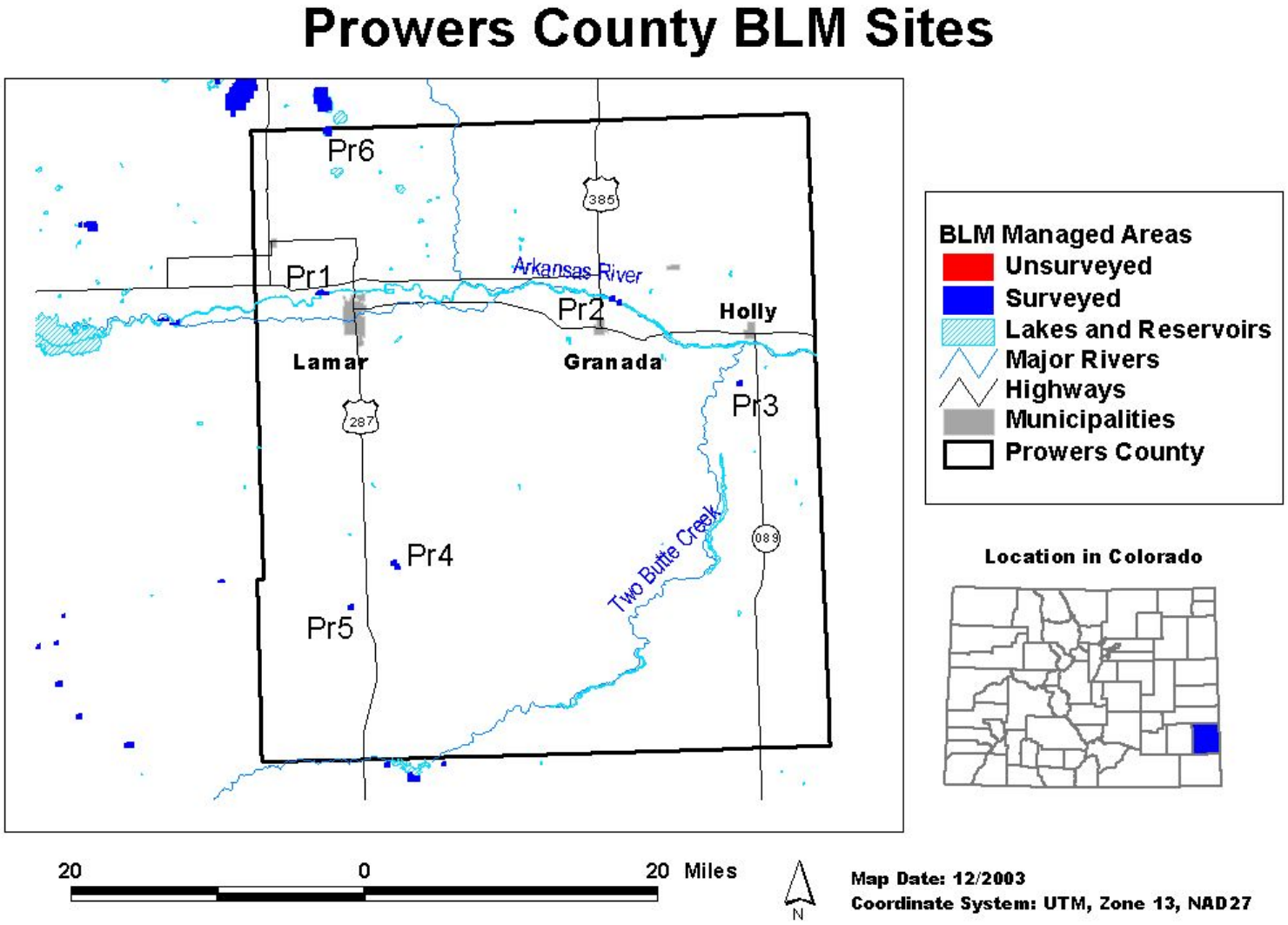

Fig. 16. Prowers County and associated BLM field sites.

Sedgwick County

Three sites are located in Sedgwick County; however, none of these were visited in the field. Access to two of the sites was denied, while the final site was not visited because of logistical reasons. The site was planned to be visited along with the other two sites. However, once it was learned that access was denied to the other sites, the trip was cancelled. Presumed poor black-tailed prairie dog habitat at the site also contributed to the decision.

S1

The landowner was adamant about not granting access to this 43-acre parcel in northeastern Sedgwick County, approximately four miles south of Julesberg. A roadside survey was attempted from I-76, but could not be completed due to the local topography of the area. The vegetation is presumed to be short-grass prairie, with a substantial amount of topography. Due to this, the habitat suitability ranking for black-tailed prairie dogs at this site is fair. The likelihood that this site could support populations of prairie dogs in the future is poor because no known colonies exist within dispersal distance of the site. No pictures exist for this parcel.

S2

Permission was obtained to visit this 40-acre parcel located in Sedgwick County, just 1.5 miles from the Logan County line. However the parcel was not visited since there were no other parcels to be visited in the vicinity. The site is located in sand hills and is presumed to be dominated by sandy soils covered with sand sagebrush. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site. No pictures exist for this site.

S3

The 39-acre parcel located in northwestern Sedgwick County was not visited because access was denied by the landowner. The site is located in the middle of the braided South Platte River channel. Riparian vegetation is presumed to dominate the site. This site surely provides good cover for many species, but does not meet the requirements for potential black-tailed prairie dog habitat. Therefore, potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site. No pictures exist for this site.

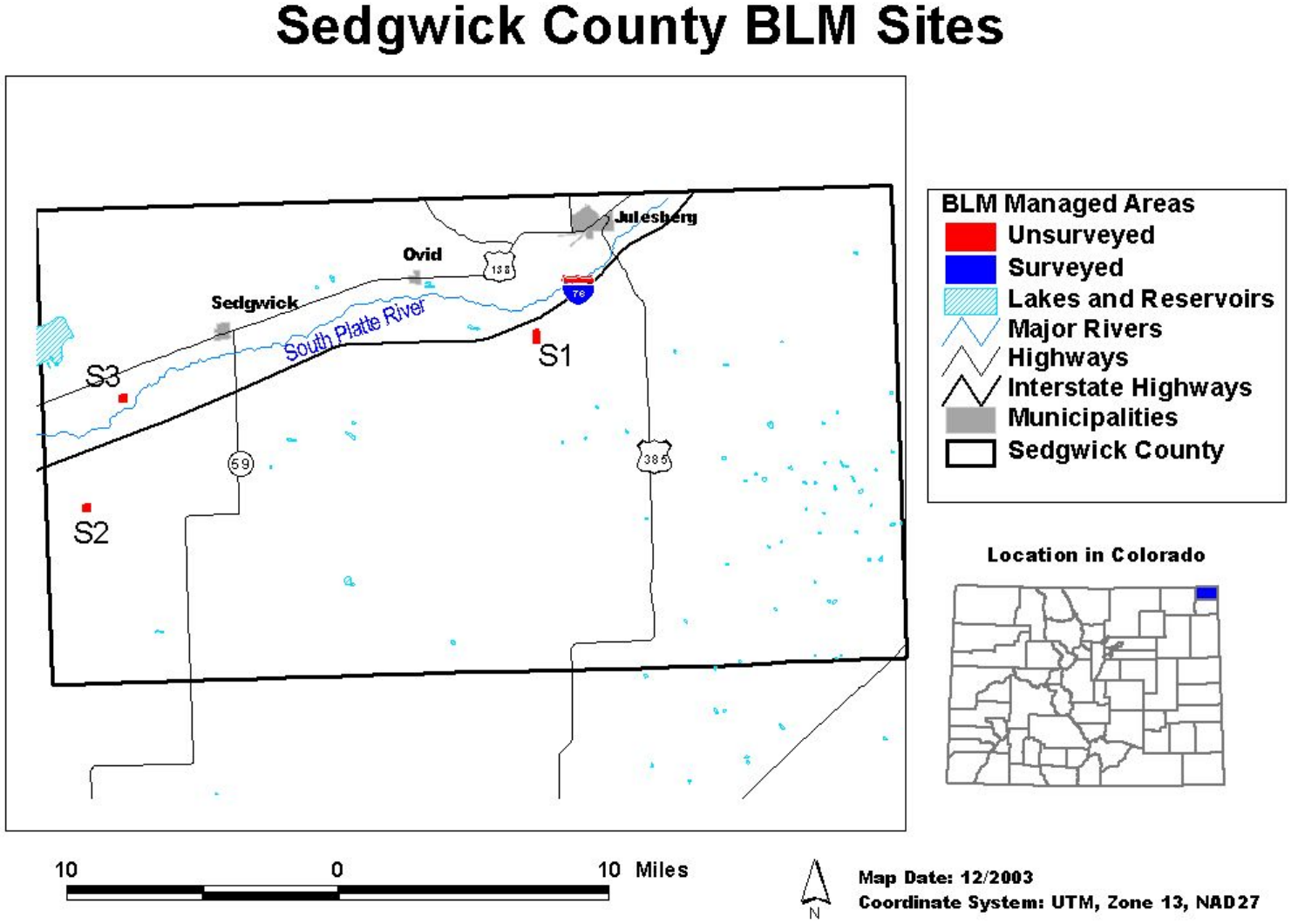

Fig. 17. Sedgwick County and associated BLM field sites.

Washington County

Three sites are located in Washington County, and all three were visited in the field. There were no black-tailed prairie dog colonies found at the sites, except an active colony was located very close to site Wa2.

Wa1
This 640-acre site is located in northern Washington County, in and around Prewitt Reservoir. Only a small portion of this acreage lies outside of the lake. Approximately 100-acres is located on land on the south side of the reservoir, but permission was not received to access this area. The area just below the dam was accessed and is depicted by photos 8 and 9. Cottonwoods dominate the area, and their success can most likely be attributed to dam seepage. As expected, cheatgrass dominates the disturbed site, along with needle and thread and Indian ricegrass. Sand sagebrush, prickly pear and lupine can be found in the shrub and forb layer respectively. The area has minimal slopes to the northwest, with sandy soils. Potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site. However, Prewitt Reservoir and the associated riparian fringe provide habitat for many species. Several American White Pelicans were observed fishing on the reservoir.

Wa2
This 41-acre site is located in southeastern Washington County, at the edge of the Sand Hill region. The shortgrass prairie site is depicted by picture 76. Permission was not obtained to access the site, so the survey was completed from a road, 400 m away. Buffalograss dominates the site with scattered sand sagebrush. There is a southeast facing slope of 2-10%, as the site is situated on a gentle hill top. There is an active colony just south of the site, although there does not appear to be any burrows on the parcel. Due to the fairly steep slopes, potential black-tailed prairie dog habitat is good. However, the likelihood that the colony will expand onto a portion of this parcel is excellent, due to the close proximity of the colony.

Wa3
The 116-acre site is located in southeastern Washington County, in the western edge of the Sand Hills. The site, depicted by pictures 74 and 75, is dominated by sand sagebrush. The shrubs yucca and prickly pear cactus are found there, along with the graminoids needle and thread and junegrass. Scarlet globemallow, wholly plantain, spiderwort and phlox dominate the forb layer. There is a rolling, north facing slope of 2-10%, with underlying sandy loam soils. Due to the high shrub cover and sandy soils, potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood of future prairie dog populations being supported on this site.

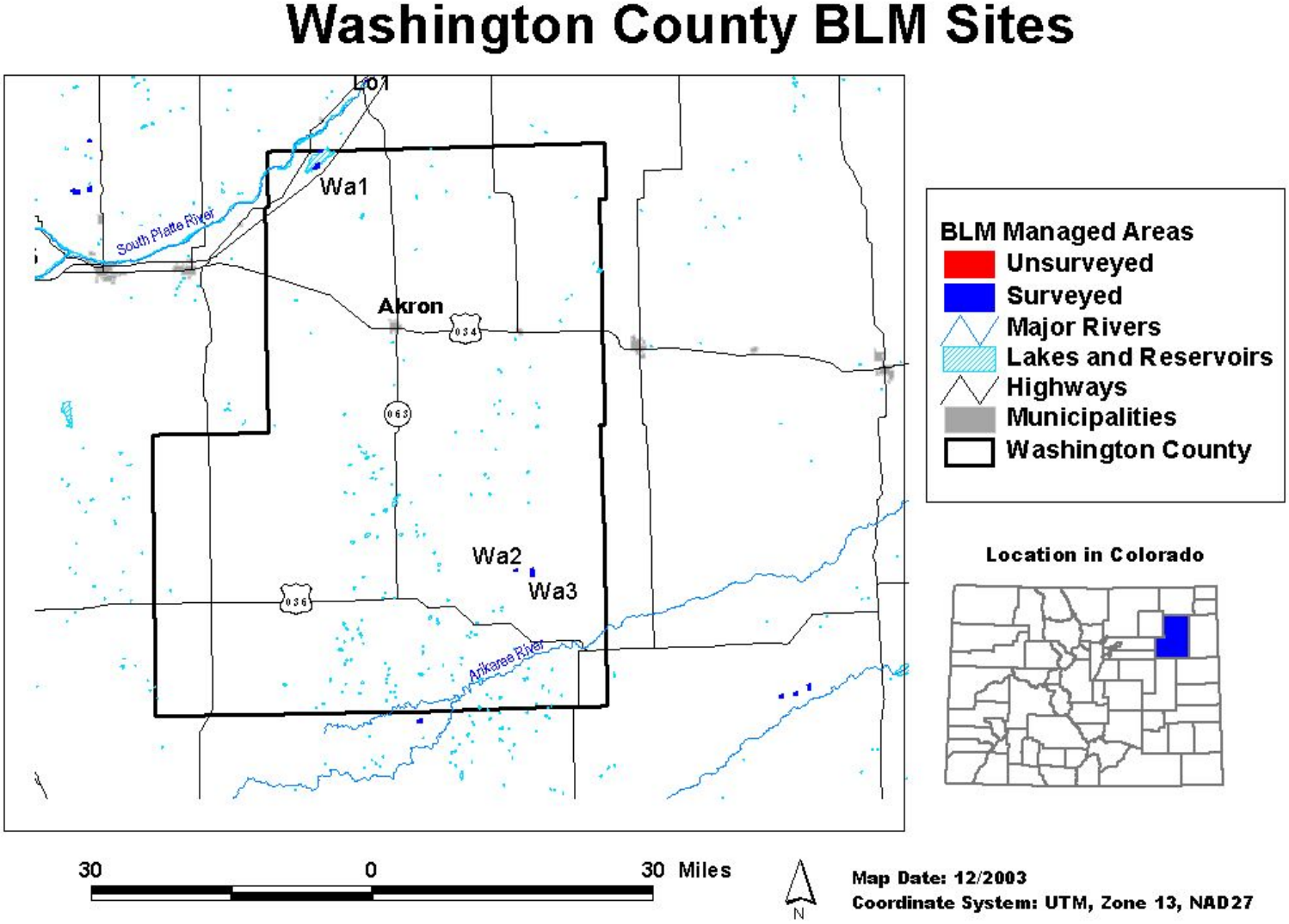

Fig. 18. Washington County and associated BLM field sites.

Weld County

Two sites are located in Weld County, in and around Riverside and Empire Reservoirs. Both of these sites were visited in the field and did not contain any colonies.

We1

This 2920-acre site straddles the border between Weld and Morgan Counties, and is partially inundated by Empire Reservoir. Approximately 100-acres are located outside the reservoir, but only in small strips along the dam. The highly disturbed site is depicted by pictures 4 and 5. Cottonwood stands line the borders of the reservoir and impoundment, while sand sagebrush, prickly pear, cheatgrass, Indian ricegrass, needle and thread, penstemon and Russian thistle can be found on the areas just below the dam. There is a northwest facing slope of 0-2%, with associated sandy soils. Potential black-tailed prairie dog habitat at this site is poor, although the reservoir and associated riparian fringe surely provides habitat for many other species. Given the habitat potential, the likelihood of future prairie dog populations being supported on this site is poor.

We2

This 1400-acre site is located in eastern Weld County, in and around Riverside Reservoir. Pictures 1 and 2 depict the site. Only about 20-acres falls on dry land at this site, and most of those are arranged in a linear fashion along the steep, disturbed slopes of the reservoir. Due to dam seepage, some ribbon communities of cottonwood exist, with an occasional interspersed locust. Cheatgrass dominates the remainder of the site. There is a northeast aspect with gentle slopes, except for the steep incline around the dam. Sandy loam underlies the highly disturbed site. Potential black-tailed prairie dog habitat at this site is poor, although the reservoir and associated riparian fringe surely provides habitat for many other species. Given the habitat potential, the likelihood of future prairie dog populations being supported on this site is poor.

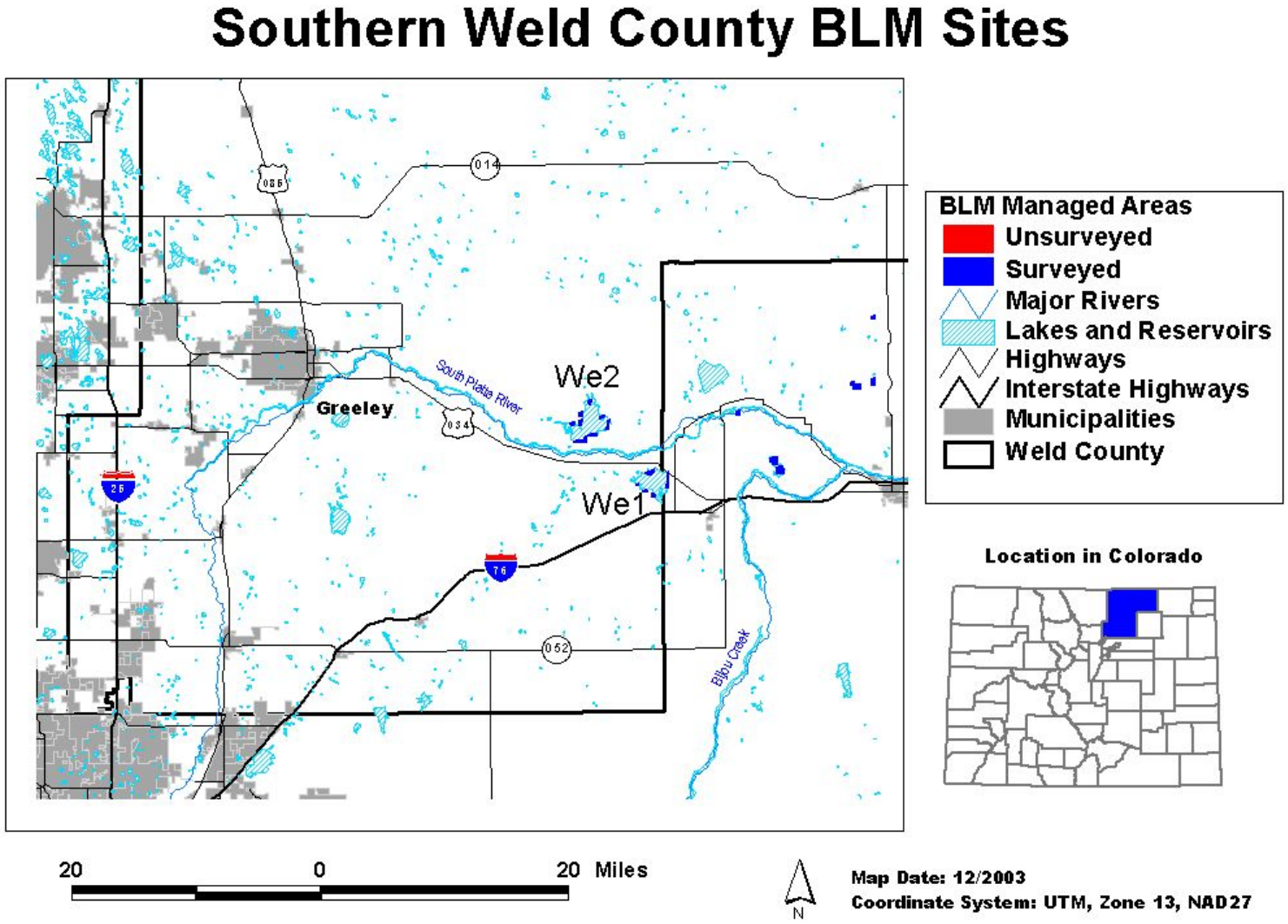

Fig. 19. Southern Weld County and associated BLM field sites.

Yuma County

Four sites are located in Yuma County, two north of Wray and two in the extreme southern part of the county. All four sites were field visited and none of them contained populations of prairie dogs.

Y1
The 39-acre site is located in northeast Yuma County, approximately three miles from the Nebraska border. The shortgrass prairie and shrubland site is depicted by pictures 91 and 92. Needle and thread, blue grama and junegrass dominate the graminoid layer. Sand sagebrush, yucca and prickly pear compose the shrub stratum, while penstemon and aster are found in the forb layer. The site is characterized by rolling, sandy hills with a north facing slope of 2-10%. Based on the soils and shrub cover, potential black-tailed prairie habitat at this site is fair, while the likelihood that populations will be found here in the future is poor.

Y2
This 39-acre site is also located in northeast Yuma County, approximately three miles from the Nebraska border. The shortgrass prairie and shrubland site is depicted by pictures 88 and 89. Needle and thread, junegrass, sand sagebrush, yucca and prickly pear cactus compose the graminoid and shrub layers respectively. Spiderwort, aster and penstomen dominate the diverse forb layer. There is a north facing slope of 6-15%, in this region of rolling, sandy hills. Based on the soils, slope and shrub cover, potential black-tailed prairie habitat at this site is poor, while the likelihood that populations will be found here in the future is also poor.

Y3
This site is composed of three parcels, located within two miles of each other, in southwestern Yuma County. The western parcel (photos 78-79) is 40-acres, the central parcel (80-81) is also 40-acres, and the eastern parcel photos (82-83) is 80-acres in size. Vegetative composition is similar throughout the site. The landscape is broken by many heavily eroded draws leading to the South Fork of the Republican River located two miles to the southeast. The shrub layer composed of yucca, snakeweed, prickly pear and sand sagebrush dominates the site. Buffalograss, blue grama, western wheatgrass, and junegrass compose the graminoids, while scarlet globemallow, slimflower scurfpea, Russian thistle, wholly plantain, spiderwort and yellow-wholly white are found in the diverse forb layer. Slopes vary from 2-15% trending southeast with underlying loamy to clay loam soils. Due to the steep slopes and high shrub cover, potential black-tailed prairie dog habitat at this site is fair, as well as the likelihood that future populations could inhabit the site. The NDIS black-tailed prairie dog distribution map indicated colonies to be in the vicinity of the site, but upon field verification, no such colonies existed.

Y4
This site contains three 10-acre parcels located in southeastern Yuma County, immediately downstream of Bonny Reservoir. The three parcels are located within one mile of each other along the South Fork of the Republican River. The western parcel is depicted by photos 84 and 85, the central parcel corresponds to picture 86, and there are no pictures of the eastern parcel because permission could not be obtained to access that area. Cheatgrass, smooth brome, crested

wheatgrass and Russian thistle dominate the western parcel. The smooth brome and thistle were of substantial size due to the high moisture availability of the site. The central parcel contains the same species along with a small stand of cottonwoods and Russian olive, with scattered yucca and sand sagebrush throughout. The high amount of exotic and ruderal species found at this site can be attributed to the disturbance after construction of the dam and perhaps seeding by the Bureau of Land Reclamation. There is a gentle east facing slope underlain by damp, loamy soils. Due to these factors, potential black-tailed prairie dog habitat at this site is poor, as well as the likelihood that future populations could inhabit the site.

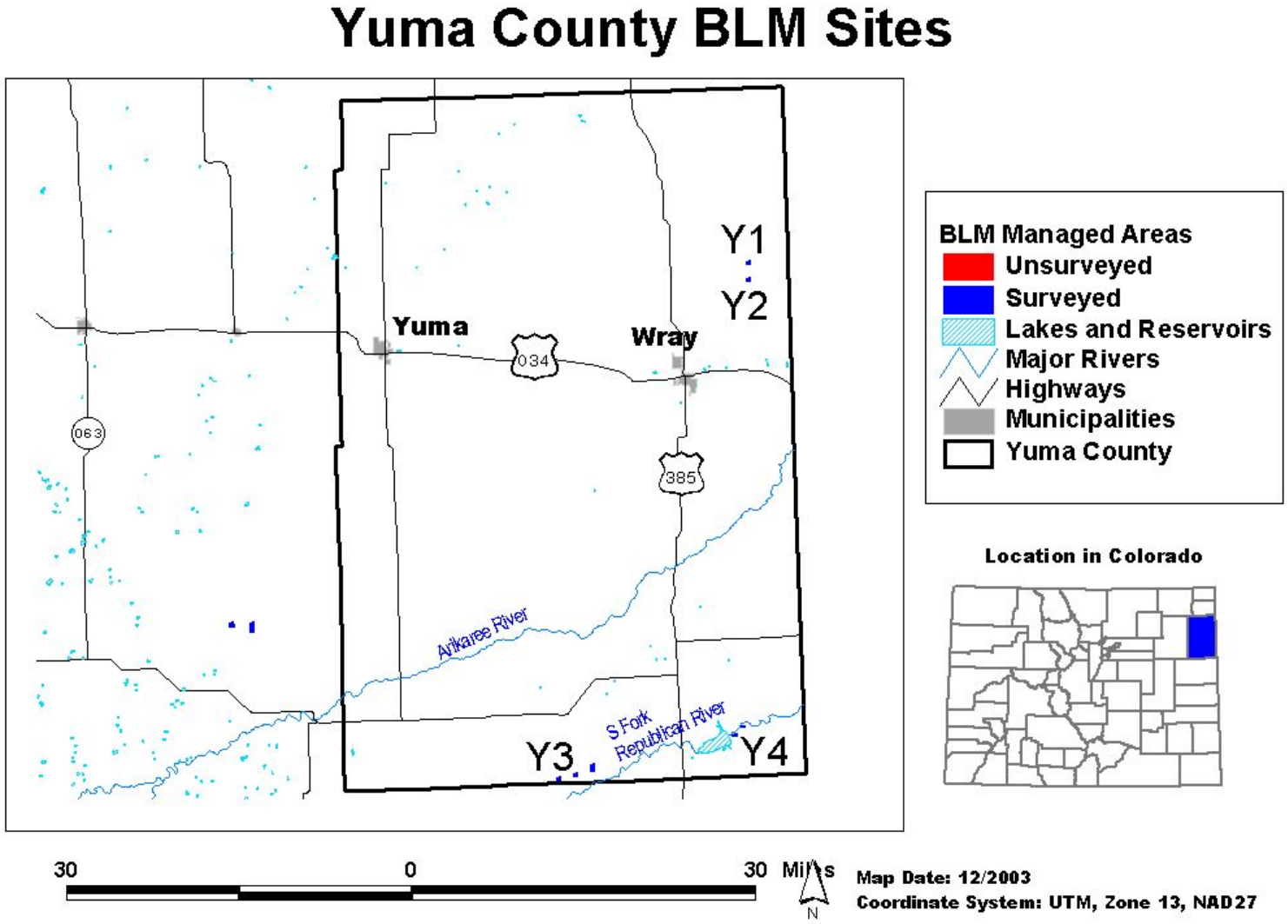

Fig. 20. Yuma County and associated BLM field sites.

Potential Conservation Areas

A total of 14 Potential Conservation Areas (PCA) associated with BLM lands are identified as having healthy resources of conservation significance (Fig. 21). Some of the PCAs contain viable populations of prairie dogs, others contain shorebird-breeding habitat, while others contain unique vegetative features. All of these areas are supporting populations of animals, plants, and/or natural communities of conservation significance within eastern Colorado and on a global scale. Most of these PCAs are drawn at scales larger than the sizes of the BLM parcels and some of these PCAs do not include BLM lands within their boundaries, but are near BLM parcels. It is the consensus of the authors that BLM managers should be aware of these natural resources and make considerations for them in future management plans and decisions. None of the PCAs are ranked as having outstanding biodiversity significance, but five are very high in biodiversity significance, four more have high significance, three have moderate significance and there are two PCAs of general interest. The map identifying the locations of these PCAs and the descriptions of these PCAs start on the following page.

Potential Conservation Areas

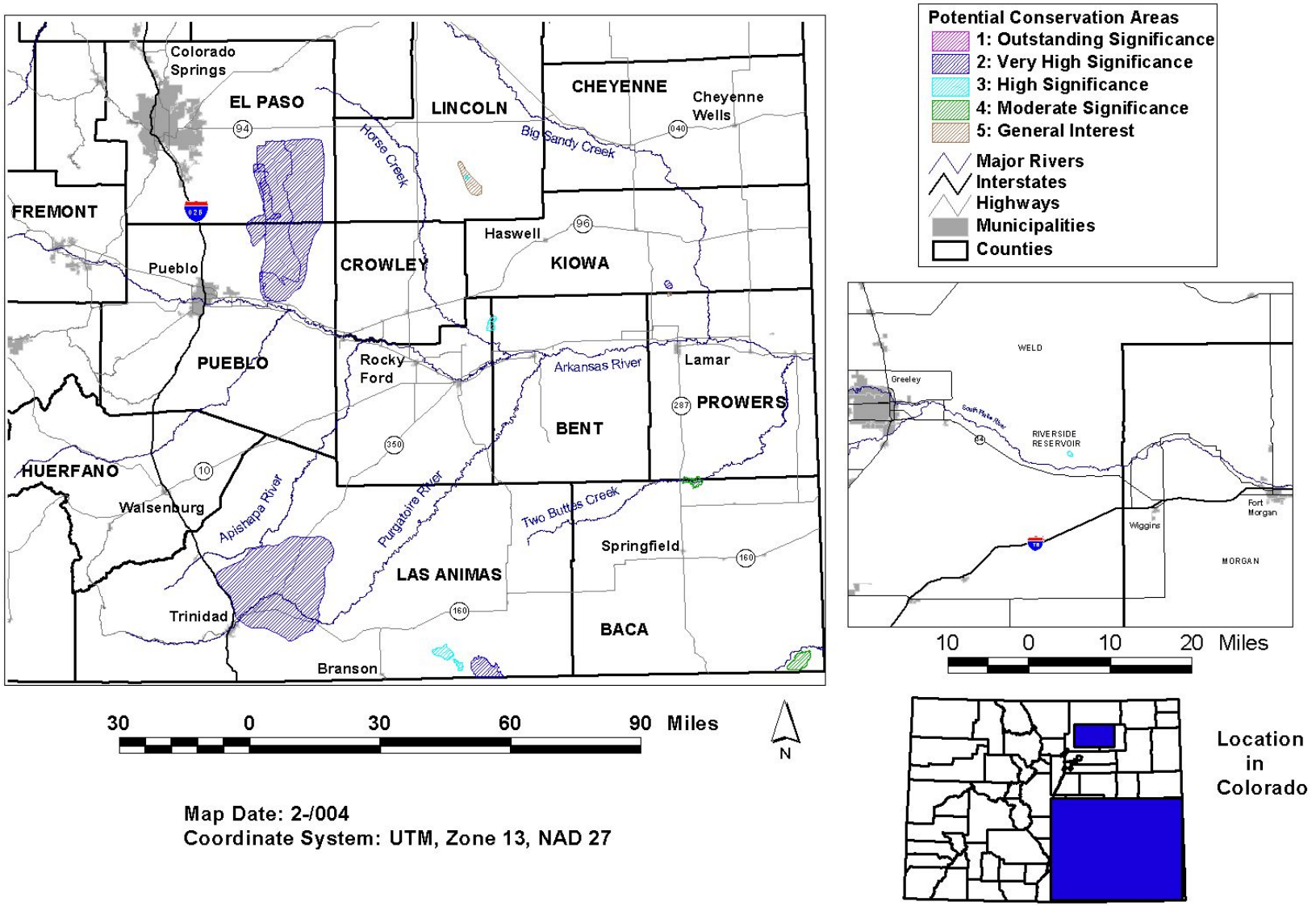

Fig. 21. Map of the study area showing the location of the potential conservation areas.

B2 POTENTIAL CONSERVATION AREAS

CHICO BASIN SHORTGRASS PRAIRIE

Biodiversity Rank: B2 (Very high significance)
The Chico Basin Shortgrass Prairie site supports several excellent and good (A and B ranked) occurrences of Mountain Plover (*Charadrius montanus*), a globally imperiled (G2/S2) species

Protection Urgency Rank: P2 (High urgency)
Development pressures are high on privately owned portions of the PCA and several small residential developments already exist within and adjacent to the PCA. This construction consists of modular homes placed on small lots, and is occurring along the west side of the Ellicott Highway just to the north of the Squirrel Creek Road site.

Management Urgency Rank: M4 (Low urgency)
Current management seems to favor the persistence of the zoological elements on this site, but new management actions may be needed in the future to maintain the current quality and mosaic of these occurrences.

Location: The PCA is located in eastern El Paso and Pueblo counties, approximately 20 miles east of Colorado Springs and 10 miles west of Pueblo. The boundary of the site begins four miles south of Ellicott in El Paso County and extends south to the Pueblo Chemical Depot and is bisected by the north-south trending Signal Rock Sandhills PCA.

Associated BLM Parcel(s): Contains E1, E2, E3 and E4.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s):

Bar JH Ranch,
Boone Hill,
Edison School,
Hanover,
Hanover SE,
Hanover NW,
Hanover NE,
Highlands Church,
North Avondale,
North Avondale NE,
Rush,
Truckton,
Truckton SE,
Truckton NE,
Yoder.

T15S R63W Sections 25 and 36;
T15S R62W Sections 30-32;
T16S R63W Sections 1, 12, and 16
T16S R62W Sections 5-9, 16-22, 27-34;
T17S R62W Sections 3-5, 8-10, 15-17, 20-32
T17S R63W Sections 25, 35, and 36;
T18S R62W Sections 5-8, 17-19;
T18S R63W Sections 1-3, 10-14, 23-26;
T14S R60W Sections 28-33;
T14S R61W Sections 25-29, 31-36;
T15S R60W Sections 3-10, 15-22, 27-34;
T15S R61W Sections 1-17, 20-28, 33-36;
T16S R60W Sections 3-10, 15-22, 28-33;
T16S R61W Sections 1-5, 7-30, 32-36;
T17S R60W Sections 4-9, 6-21, 28-33;
T17S R61W Sections 1-5, 8-17, 20-28, 30-36;
T18S R60W Sections 4-9, 17-19, 30 and 31;
T18S R61W Sections 1-5, 8-17, 20-29, 30-36;
T19S R61W Sections 1-4, 9-15, 22-27, 34-36
T19S R62W Sections 31-35;
T20S R61W Sections 2-3, 6-11, 14-22, 28-32;
T20S R62W Sections 1-17, 20-29, 33-36

Size: 185,667 acres (75,016 ha)
Elevation: 4,480 to 6,245 feet (1,366 to 1,903 m)

Site Description: The Chico Basin Shortgrass Prairie site encompasses over 250 square miles of shortgrass prairie in northern Pueblo and southern El Paso counties. The site is characterized by a mixture of open, flat areas and gently rolling terrain that drains into mostly ephemeral streams and swales, or in the northeast section, closed-basin depressions (playas). The site includes extensive tracts of native shortgrass prairie with ground cover that consists primarily of closely grazed stands of blue grama (*Bouteloua gracilis*). Cholla (*Opuntia imbricata*) and yucca (*Yucca glauca*) occur in scattered to moderately dense stands on some portions of the PCA. Plant species diversity generally is low throughout the site with dominant species including blue grama, three-awn grass (*Aristida* spp.), galleta grass (*Hilaria jamesii*), sand dropseed (*Sporobolus cryptandrus*), rabbitbrush (*Chrysothamnus nauseosus*), yucca, cholla, and prickly pear (*Opuntia* spp.).

Many large black-tailed prairie dog (*Cynomys ludovicianus*) complexes occur scattered throughout the site. Prairie dogs are thought to be a keystone species (Kotliar et al. 1999) and their presence increases the diversity of plant and animal communities within the site. Burrowing Owls (*Athene cunicularia*) are commonly seen within prairie dog colonies within the PCA. Many breeding locations for Mountain Plover (*Charadrius montanus*), a declining shortgrass prairie species, are documented within the site. Mountain Plover are known to inhabit areas with low vegetation and a high percentage of bare ground such as prairie dog towns and heavily grazed shortgrass prairie (Knopf 1996b).

The PCA is covered by a mosaic of soil types (U.S.D.A. Soil Conservation Service and Colorado Agricultural Experiment Station 1981). Most of the observed prairie dog towns, Burrowing Owls, and Mountain Plovers, however, occurred on a single soil type: Bijou sandy loam. Rapid permeability, moderate available water capacity, low organic matter in its surface layer, and slow surface runoff characterize this deep, well-drained soil. The hazards of erosion and soil blowing are moderate, and the effective rooting depth for plants is 60 inches (150 centimeters) or more (U.S.D.A. Soil Conservation Service and Colorado Agricultural Experiment Station 1981).

Other shortgrass prairie wildlife species known within the site include swift fox (*Vulpes velox*), McCown's Longspur (*Calcarius mccownii*), Long-billed Curlew (*Numenius americanus*), and massasauga (*Sistrurus catenatus*). In addition, ongoing monitoring at the Pueblo Chemical Depot in the southern portion of the site has documented 21 mammal species, 52 orthopteran species, 65 additional arthropod species from five orders, five species of herpatofauna, and numerous species of songbirds and hawks. The Depot supports a large and healthy population of black-tailed prairie dogs that is recovering from a plague epizootic of 1999.

Grazing of domestic livestock occurred historically on most of the site and continues today. Portions of Pueblo Chemical Depot have not been grazed since 1942. Small portions of the site, especially on private property, were converted to agricultural croplands during the past 100 years. The cultivation of some of these areas was subsequently abandoned, producing old-field (weedy, early-successional) habitats. Small areas of the site remain under cultivation. On the

private land portions, some areas have been developed for rural housing. Development pressure is increasing and land is being subdivided, usually into 35-acre parcels.

Natural Heritage element occurrences at the Chico Basin Shortgrass Prairie PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Charadrius montanus	**Mountain Plover**	**G2**	**S2B**				**A**
Charadrius montanus	**Mountain Plover**	**G2**	**S2B**				**A**
Charadrius montanus	Mountain Plover	G2	S2B				B
Charadrius montanus	Mountain Plover	G2	S2B				B
Charadrius montanus	Mountain Plover	G2	S2B				B
Charadrius montanus	Mountain Plover	G2	S2B				C
Charadrius montanus	Mountain Plover	G2	S2B				C
Charadrius montanus	Mountain Plover	G2	S2B				D
Vulpes velox	Swift Fox	G3	S3				A
Sistrurus catenatus	Massasauga	G3G4	S2				E
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				A
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				A
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				B
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				B
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				B
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				C
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				C
Cynomys leucurus	White-tailed prairie dog	G4	S4				C
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				C
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				C
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				C
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				C
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				D
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				D
Calcarius mccownii	McCown's Longspur	G5	S2B				B
Calcarius mccownii	McCown's Longspur	G5	S2B				C
Numenius americanus	Long-billed Curlew	G5	S2B				C
Numenius americanus	Long-billed Curlew	G5	S2B				D

*EO Rank is “Element Occurrence” Rank

** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: The Chico Basin Shortgrass Prairie site supports several excellent and good (A- and B-ranked) occurrences of Mountain Plover (*Charadrius montanus*), a globally imperiled (G2/S2) species designated as a candidate for federal listing as threatened, sensitive by the BLM and Forest Service, and a species of special concern by the State of Colorado. The site also supports an excellent occurrence of swift fox (*Vulpes velox*), a globally vulnerable (G3/S3) species designated a candidate for federal listing as threatened, sensitive by the Forest Service, and a species of special concern by the State of Colorado. Several excellent to fair (A- to C-ranked) occurrences of black-tailed prairie dogs (*Cynomys ludovicianus*) (G4/S4), a species petitioned for federal listing as threatened and a species of special concern in Colorado, also occur within the site.

Boundary Justification: The boundary encompasses the numerous locations at which breeding Mountain Plovers were observed and adjacent areas of suitable breeding habitat. The site is

bisected throughout its length by a five-mile wide zone of relatively rolling terrain covered by aeolian (wind-deposited) sands and by vegetation (especially sandsage (*Artemisia filifolia*)) that render the land unsuitable for use by Mountain Plovers. Mountain Plovers prefer flat, open areas with very low-growing or closely-cropped vegetation. This vast expanse of very loose, sandy soil is also unsuitable for burrow construction and therefore is unoccupied by prairie dogs (and Burrowing Owls). The borders include the best known high quality shortgrass prairie habitat. The northeast border may expand as additional information becomes available.

Protection Rank Comments: The western portion of the PCA is privately owned or State Land Board property leased to The Nature Conservancy (Bohart Ranch), Chico Basin Ranch, or the Transportation Test Track. The eastern portion of the PCA is primarily privately owned with parcels of State Land Board property interspersed, while the Department of Defense Pueblo Chemical Depot owns the southernmost portion. Development pressures are high on privately owned portions and several small residential developments already exist within and adjacent to the site. This construction consists of modular homes placed on small lots, and is occurring along the west side of the Ellicott Highway just to the north of the Squirrel Creek Road site.

Present land uses are compatible with the maintenance of a viable breeding assemblage of Mountain Plovers. However, the privately owned sections of the site are highly susceptible to low-density residential development pressures. On the state-leased lands, no protection actions are thought to be necessary in the foreseeable future, but protection actions are needed to secure long-term conservation. Likewise, the Pueblo Chemical Depot is facing decommissioning within the next 15 years and protection actions are needed to secure long-term conservation.

Management Rank Comments: Current management seems to favor the persistence of the zoological elements on this site, but new management actions may be needed in the future to maintain the current quality and mosaic of these occurrences. Factors that might prompt the need for new management actions might include the effects of a change in the livestock grazing regime or other agricultural practices, additional land development, and the impacts of human activities and disturbances within the site. Continuation of current livestock grazing practices may benefit Mountain Plovers by maintaining the closely cropped vegetation preferred by these birds.

Changes in management may be needed in the future to maintain the current quality of the prairie dog colonies (and Burrowing Owl habitat). Grazing intensity varies considerably across the site, and therefore the effects of grazing on prairie dog habitat vary within the site. In the future, changes in the timing and intensity of livestock grazing may be useful as a means of improving habitat for prairie dogs and Burrowing Owls.

JESUS MESA

Biodiversity Rank: B2 (Very high significance)
The Jesus Mesa PCA contains a good (B rank) occurrence of a globally imperiled (G2) plant community. The A and B-ranked natural communities of this site are of global significance. Several state imperiled species are also found in the area.

Protection Urgency Rank: P1 (Very high urgency)
Protection actions needed immediately. At the time this PCA was developed the ranch containing it was for sale. Without knowledge of the buyer this PCA should be considered threatened. It is noteworthy that there could be little use of this land except for livestock grazing.

Management Urgency Rank: M3 (High urgency)
New management actions may be needed within 5 years to maintain the current quality of the element occurrences in the PCA. The current management of the ranch has maintained viable natural communities in most areas. A change in ownership may create more pressure to heavily utilize many grasslands. Current trends in the existing management are toward increasing livestock use. More cattle have been stocked on the area throughout the middle 1990's.

Location: Jesus Mesa is on the south side of Mesa de Maya on the Colorado/New Mexico state line 57 mi east of Trinidad, Colorado. Turn on to 325 from and travel approximately 22 miles east to the Spool Ranch entrance (this is also the Cotton Top Mesa Ranch entrance). Drive in approximately 2.5 miles to the ranch headquarters. After checking in, continue down the main road to the second right turn. Follow this road up to the top of Jesus Mesa.

Associated BLM Parcel(s): Contains La10.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s):

Corbett Mesa North, Jesus Mesa.
Dennis Mesa,

T34S R53W Sections 31; T35S R53W Sections 5-8, 17 and 18;
T34S R54W Sections 20-22, 26-36; T35S R54W Sections 1-17.

Size: 14,850 acres (6,010 ha)
Elevation: 5,000 to 5,900 feet (1,524 to 1,798 m)

Site Description: Jesus Mesa is a southward extension of Mesa de Maya. It is distinguished from the Mesa de Maya by the 500' cliffs of Jesus Canyon on the east and the broad Cobert Canyon to the west. The top of the mesa is an extensive, flat, short- to mid- grass prairie wherein exists a large playa. The edges of the basalt-capped mesa form broken cliffs, which quickly become more gradually sloped grasslands and shrublands. The largely inaccessible slopes are covered with a rich grassland or shrubland community. Jesus Canyon is a rugged canyon with permanent pools of water containing fishes. The head of this canyon is extremely rugged and heavily vegetated.

The dominant ecological processes that influence this PCA include the presence of water, especially in flash flooding. Wind and livestock grazing are additional processes of significance.

Patterns of rainfall dominate the climatic factors of this site. Rainfall is sporadic with most occurring during the summer "monsoon" and during the winter snow season. Dry thunderstorms are common in the summer and consequently fire evidence is also common. Winters are cool to cold with high winds common.

Indigenous peoples have utilized the Mesa de Maya area for at least 5,000 years. Numerous historic and archaeological sites occur on Jesus Mesa. Poorly studied, these sites are easily located and observed. Indian relics have been identified throughout the area. The time period covered is early indigenous to the homesteading period. In the late 18th and early 19th centuries, the Spanish (Mexican) citizens colonized the lands around the Mesa. Evidence of their adobe homes is prevalent. With the immigration of Americans into the area came small scale farming on homesteads. Finally with drought and economic difficulties, farming abated and livestock production began. Today, livestock grazing (mostly cattle) is the sole use of the area along with hay production. No hay production occurs on the Jesus Mesa PCA. Grazing is restricted to areas where water development occurs or where natural water persists. Cattle tanks are present in several places, but the main water development is that of windmill pumps. The adjacent landscape is similarly utilized for livestock production for many miles around. Small amounts of hay production occur along the Dry Cimarron River. There is an elk-ranching operation adjacent to the Jesus Mesa PCA. There are two roads cut onto the mesa, one from Jesus Canyon and the other, the main road, from Cobert Canyon.

Steep cliffs and broken rock occurs on the slopes of the mesas. Rattlesnakes are seen but are not more common than elsewhere. The roads can be rutted and have numerous fallen rocks on them, particularly after a hard rain. The roads can be quite slick after rains.

Some cheat grass and Japanese brome occurs on the PCA; however, the density is very low. Most of the other weeds are merely native increasers. Most exotics are in areas that have been traditionally grazed hard by cattle.

Natural Heritage element occurrences at the Jesus Mesa PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Andropogon gerardii-Schizachyrium scoparium	Xeric Tallgrass Prairie	G2?	S2				B
Cercocarpus montanus/Stipa neomexicana	Foothills Shrubland	G2G3	S2S3				C
Schizachyrium scoparium-Bouteloua curtipendula	Great Plains Mixed Grass Prairies	G3	S2				C
Bouteloua eriopoda-Hilarii jamesii	Shortgrass Prairie	G3	SU				B
Nolina texana	Desert Shrubland	GU	S1				A
Cheilanthes standleyi	Standley's Cloak Fern	G4	S1				A

Cheilanthes standleyi	Standley's Cloak Fern	G4	S1				
Asclepias macrotis	Long-hood Milkweed	G4	S2				
Sarcostemma crispum	Twinevine	G4G5	S1				
Nolina texana	Texas Beargrass	G5	S1				
Sapindus drummondii	Soapberry	G5T5	S1				B

*EO Rank is "Element Occurrence" Rank
** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: The Jesus Mesa PCA contains a good (B rank) occurrence of the globally imperiled (G2) Xeric Tallgrass Prairies (*Andropogon gerardii-Schizachyrium scoparium*) natural community. The A and B-ranked natural communities of this PCA include Foothills Shrubland (*Cercocarpus montanus/Stipa* neomexicana), Great Plains Mixed Grass Prairies (*Schizachyrium scoparium-Bouteloua curtipendula*), Shortgrass Prairie (*Bouteloua eriopoda-Hilaria jamesii*), and Desert Shrubland (*Nolina texana*) and all are of global significance. Several state imperiled species are also found in the area including Standley's Cloak Fern (*Cheilanthas standleyi*), Long-hood Milkweed (*Asclepias macrotis*), Twinevine (*Sarcostemma crispun*), Soapberry (*Sapindus drummondii*), and Texas Beargrass (*Nolina texana*).

This PCA also contains a great deal of undocumented natural community data. Many of these common communities are found in excellent representations. Also numerous additional state rare animals can be expected to occur here.

Boundary Justification: The boundary includes the entire mesa and its slopes down to where they begin leveling out. The PCA also includes Jesus Canyon. The boundary onto the Mesa de Maya goes beyond the headwaters of Jesus Creek to include a significant buffer toward the Mesa's peak.

Protection Rank Comments: Protection actions needed immediately. At the time this PCA was developed the ranch containing it was for sale. Without knowledge of the buyer this PCA should be considered threatened. Jesus Mesa site is currently unprotected and in private ownership. The land is managed for cattle grazing with a few big game hunts occurring. What protection exists is from the good intentions of the ranch manager, Roy Wittenburg and the parent corporation. Water availability limits access to many areas. It is noteworthy that there could be little use of this land except for livestock grazing. The ranch is large enough to have high open space values and to contain significant populations (probably viable) of many common species of plants and animals. Wildlife is abundant and varied at this site.

Management Rank Comments: New management actions may be needed within 5 years to maintain the current quality of the element occurrences in the PCA. The current management of the ranch has maintained viable natural communities in most areas. A change in ownership may create more pressure to heavily utilize many grasslands. Current trends in the existing management are toward increasing livestock use. More cattle have been stocked on the area throughout the middle 1990's.

An understanding of fire impacts on the landscape ecology would be useful. More inventory for state-rare elements is warranted, but most importantly is the inventory of natural community variety and condition. Comparisons with other similar occurrences elsewhere are needed. Most

of the management necessary at this site will include closer controls on grazing activity. With changes in the grazing regimen and numbers, it may be possible to restore the grasslands. Fire management might be necessary on the slopes where juniper and oaks flourish. However, natural fire frequency may be ongoing, but with some decrease in fuel build up resulting from grazing.

NEESKAH

Biodiversity Rank: B2 (Very high significance)
The Neeskah PCA contains an excellent (A rank) occurrence of the globally vulnerable (G2) Piping Plover (*Charadrius melodus*).

Protection Urgency Rank: P2 (High urgency)
The Neeskah PCA offers unique opportunities for conserving habitat of two birds of conservation significance in Colorado through a conservation easement with the current landowner or purchase and protection of the area if the landowner is willing.

Management Urgency Rank: M4 (Low urgency)
Current management seems to favor the persistence of the zoological elements on this site, but new management actions may be needed in the future to maintain the current quality and mosaic of these occurrences.

Location: This PCA is at the Neeskah Reservoir, which is located approximately 15 miles north of Lamar, Colorado east of Highway 287 in south-central Kiowa County. To reach the PCA take Highway 287 approximately 9.7 miles north of Wiley, Colorado to County Road C and follow C east for 3 miles to the reservoir.

Associated BLM Parcel(s): Contains K6.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s): Neenoshe Reservoir, T20S R47W Sections 22, 23-27 and 35.

Size: 1,404 acres (468 ha)
Elevation: 3,850 feet (1,174 m)

Site Description: This PCA contains riparian areas along the lakes fringe dominated by the graminoids western wheatgrass, alkali sacaton and the rush *Juncus arcticus ater*. There are small stands of cottonwood and tamarisk, and the forbs Indian blanketflower and slimflower scurfpea are present. The PCA has minimal slopes with sandy soils that drain into the basin. There are dead stands of cottonwood and tamarisk throughout, but regeneration of both species is occurring. Past nesting by Western Snowy Plover has been observed within the alkali playas occurring along the reservoir's shoreline.

Natural Heritage element occurrences at the Neeskah PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Charadrius melodus	**Piping Plover**	**G3**	**S1B**	**LT**	**T**		**A**
Charadrius alexandrinus nivosus	Western Snowy Plover	G4T3	S1B			FS/BLM	H

*EO Rank is "Element Occurrence" Rank
** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: The Neeskah PCA contains an excellent (A-ranked) occurrence of the globally vulnerable (G2) Piping Plover (*Charadrius melodus*). There is also a historical

occurrence of the apparently secure (G4) Western Snowy Plover (*Charadrius alexandrinus nivosus*).

Boundary Justification: The PCA boundary includes the reservoir edges, which support nesting habitat for two bird species.

Protection Rank Comments: The area surrounding the Neeskah PCA is a mix of private ranchland and BLM property with the majority being State Lease land. There are no special threats to this area as cattle grazing is not detrimental to any species within the PCA. However, There are only three records of breeding Piping Plover areas in Colorado. CNHP's database records only eight Western Snowy Plover breeding areas and the Colorado Breeding Bird Atlas identifies only seven (all overlapping CNHP's localities). The Neeskah PCA offers unique opportunities for conserving habitat of two birds of conservation significance in Colorado through a conservation easement with the current landowner or purchase and protection of the area if the landowner is willing.

Management Rank Comments: The water level of Neeskah Reservoir should be monitored and kept at levels suitable for the species of conservation significance breeding in the PCA. Rapidly rising water levels during nesting can cause low reproductive success of Piping Plovers. Inadvertent disturbance of birds and nests by people, dogs, and vehicles are also thought to lower reproductive success of Piping Plover. The adverse impact from roads and recreation activities should be evaluated and mitigated. Western Snowy Plover are sensitive to human intrusion, which may cause increased clutch losses. Greater public awareness and protection against human disturbance from May through July would benefit both the Piping and Snowy plover breeding at the Neeskah PCA.

SIGNAL ROCK SANDHILLS

Biodiversity Rank: B2 (Very high significance)
This PCA contains the best known (A rank) occurrence of the globally vulnerable (G3/S2) sandsage prairie (*Artemisia filifolia-Andropogon hallii*) in Colorado. The occurrence is very large and portions are in excellent condition. From roadside investigations, the area is adjacent to many other acres of similar habitat that appear to also be in good condition (with a few exceptions).

Protection Urgency Rank: P3 (Moderate urgency)
Protection actions may be necessary, but probably not within the next 5 years. It is estimated that stresses may reduce the viability of the elements in the PCA if protection action is not taken. Currently, most of the land within the site is owned by the State Land Board and managed with conservation in mind.

Management Urgency Rank: M4 (Low urgency)
Current management seems to favor persistence of the elements in the PCA, but management actions may be needed in the future to maintain the current quality of the element occurrences. Management programs for control of weeds and simulation of large-scale natural processes, such as fire and herbivory, are implemented within portions of the PCA.

Location: The PCA is located in eastern Pueblo and El Paso counties, approximately 20 miles east of Colorado Springs and 10 miles east of Pueblo. The boundary of the site begins 4 miles south of Ellicott and extends south into the Pueblo Chemical Depot.

Associated BLM Parcel(s): Contains E1, E2 and E3.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s)

Big Springs Ranch,
Boone Hill,
Devon,
Edison School,
Elliot,
Hanover NE,
Hanover NW,
Hanover SE,
Highlands Church,
North Avondale,
North Avondale NE,
Yoder.

T14S R61W Sections 31;
T14S R61W Sections 33-36;
T15S R62W Sections 6-8, 17-20, 29-32;
T16S R61W Sections 5-7, 18, 19, 30 and 31;
T16S R62W Sections 1-4, 8-29, 32-36;
T17S R61W Sections 5-8, 17-20, 29-32;
T17S R62W Sections 1-5, 8-17, 20-28, 32-36;
T18S R61W Sections 5-8, 17-20, 29-33;
T18S R62W Sections 1-5, 8-17, 20-29, 32-36;
T19S R61W Sections 4-10, 15-22, 27-34;
T19S R62W Sections 1-5, 8-27, 20-31;
T20S R61W Sections 3-6, 8-10;
T20S R62W Sections 1, 2, 6-8, 17-20, 29, 32, and 33.

Size: 133,203 acres (53,906 ha)
Elevation: 4,550 to 6,100 feet (1,387 to 1,859 m)

Site Description: The PCA is characterized by slightly rolling sandhills and interdunal swales. The majority of the PCA is dominated by sandsage prairie with sandsage (*Artemisia filifolia*) the dominant species. On large areas of the site, yucca (*Yucca glauca*) is co-dominant or more dominant than the sandsage. The understory is dominated by blue grama (*Bouteloua gracilis*) and sand dropseed (*Sporobolus cryptandrus*) with scattered patches of sand bluestem (*Andropogon hallii*) and prairie sandreed (*Calamovilfa longifolia*). The northern end of the PCA is flatter and dominated by blue grama, sand dropseed, and possibly needle-and-thread (*Stipa comata*). At the southern end of the PCA the sandsage prairie is dominant.

Steep bluffs and outcrops east of Black Squirrel Creek (called the Crows Roost) support a community characterized by sparse yucca with little bluestem (*Schizachyrium scoparium*) and sideoats grama (*Bouteloua curtipendula*). This community is classified as the *Schizachyrium scoparium-Bouteloua curtipendula* plant association (Great Plains mixed grass prairies), although sideoats grama is not always conspicuous and sand bluestem and prairie sandreed are commonly interspersed. This may be the result of the small size of the outcrops or bluffs and the sharp environmental gradient to the sandhills prairie. Small stands of coyote willow (*Salix exigua*) are present along Black Squirrel Creek, as are some cottonwoods.

A small black-tailed prairie dog (*Cynomys ludovicianus*) town is located near the western ranch entrance on soils probably derived from alluvial sediments (but still with significant sand and small coarse material). Burrowing owls and swift foxes have been seen using the prairie dog town. A golden eagle nest is located on the bluffs east of Black Squirrel Creek.

There is no natural, permanent surface water on the Bohart Ranch; therefore, there are no fish. Nonetheless, signs of temporary surface water were apparent in two areas, sandy playas and the dry riparian zones along Black Squirrel Creek. Habitat for amphibians is concluded to be rare. Since the creek rarely runs, amphibian communities are not known, and likely to be sparse at best. What amphibians may be on the site would be supported by the playas. Several of the playas we visited were of natural shape and condition, although it appears that livestock tend to concentrate in these areas and have probably altered the plant communities to some extent. These playas should be maintained under any management scenario and considered for restoration.

The reptilian community is expected to be entire, based on the observations of the Bohart Ranch manager. Most notably, the box turtle (*Terrapene ornata*) occur in large numbers. This species is expected to be in decline in many areas due to habitat loss and increased mortality on roadways. Snakes were reported to be present but not mentioned as numerous. Rattlesnakes (probably *Crotalus viridis*) were reported as occasional.

Information on breeding bird communities exist from Breeding Bird Atlas surveys in the southeastern 1/6 of each topographic quadrangle. Numerous state rare birds are possible or confirmed breeders in the area and we suspect that most of these species exist in sustainable numbers and directly benefit from the ecological integrity of the site. The Division of Wildlife has introduced lesser prairie chickens to the south at the Pueblo Depot. The birds do move out of the area and the area to the north may be good habitat for them although they currently are not documented there (personal communication with Dave Lovell - DOW).

Interviews with the Bohart Ranch manager reported that swift fox (*Vulpes velox* - G3S3?) were present on the ranch along with a few red fox (*Vulpes vulpes*) and of course coyotes (*Canis latrans*). We observed coyotes, fox, black-tailed prairie dogs, Ord's kangaroo rat, unidentified mice, mule deer, pronghorn, unidentified gophers, black-tailed jackrabbits, and abundant sign of other unidentified small mammals. The ability for grasses to set seed in this habitat probably is important for persistence of the natural small mammal community. We suspect that many of these species occur in viable populations. For example, Dick Tanner estimated that approximately 400 individuals of pronghorn occupy the Bohart Ranch at any given time. Our observations were congruent. The Division of Wildlife has documented a resident pronghorn population (not moving out of the area) in southern El Paso and northern Pueblo counties.

Invertebrate communities in the sandhills of this part of Colorado are poorly known. However, our assessment is that the area is large enough to support viable populations of most native species. Significant tiger beetles, moths, and butterfly species are likely to be found.

Natural Heritage element occurrences at the Signal Rock Sandhills PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Artemisia filifolia-Andropogon hallii	**Northern Sandhill Prairie**	**G3?**	**S2**				**A**
Artemisia filifolia-Andropogon hallii	Northern Sandhill Prairie	G3?	S2				B
Schizachyrium scoparium-Bouteloua curtipendula	Great Plains Mixed Grass Prairie	G3	S2				C
Chenopodium cycloides	Sandhill Goosefoot	G3	S1				A
Chenopodium cycloides	Sandhill Goosefoot	G3	S1				C
Ambrosia linearis	Plains Ragweed	G3	S3				B
Ambrosia linearis	Plains Ragweed	G3	S3				B
Ambrosia linearis	Plains Ragweed	G3	S3				C
Ambrosia linearis	Plains Ragweed	G3	S3				C

*EO Rank is "Element Occurrence" Rank

** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: This PCA contains the best known (A rank) occurrence of the globally vulnerable (G3/S2) sandsage prairie (*Artemisia filifolia-Andropogon hallii*) in Colorado. The occurrence is very large and portions are in excellent condition. From roadside investigations, the area is adjacent to many other acres of similar habitat that appear to also be in good condition (with a few exceptions). The classification of this plant community may change in the future, as we have very limited data on sandsage prairies, but the rarity rank of closely related communities is similar. Similar sized patches are known to occur in Kansas (although with more numerous owners) and Oklahoma in variable condition. Also within the site is moderate size occurrence of the sandstone/gravel breaks prairie (Schizachyrium scoparium - Bouteloua curtipendula). Much of the sandhills within the site (especially the Bohart Ranch) have been managed in such a way that the natural communities appear to be in good to excellent condition. The communities within the site exhibit a wide range of natural variability. This site also supports good to fair occurrences of two globally vulnerable (G3) plant species, the sandhill goosefoot (Chenopodium cycloides), and plains ambrosia (Ambrosia linearis).

Boundary Justification: The boundary encompasses the highest quality sandsage communities in the area. The boundary is drawn to exclude lands more impacted by residential development (to the north-northwest) and agricultural activities (north, east, and west) and encompasses mainly the sandhills in the area. Shortgrass prairie in somewhat natural condition (not converted to cropland) exists in the area and there appears to be sufficient size and distribution of these parcels, and corridors available for viable populations of most plant and animal species. This site is considered large enough to protect intact (or at least allow simulation of) most of the natural ecological processes necessary for survival of the elements including fire, herbivory, and geomorphology (allowing for shifting sand dunes).

Protection Rank Comments: Protection actions may be necessary, but probably not within the next 5 years. It is estimated that stresses may reduce the viability of the elements in the PCA if protection action is not taken. Currently, most of the land within the site is owned by the State Land Board and managed with conservation in mind. Most of the state land is leased by The Nature Conservancy (Bohart Ranch) or Chico Basin Ranch or is part of the Transportation Test Track. Some private and BLM lands occur in the southeast portion of the PCA. The Department of Defense Pueblo Chemical Depot occupies the southernmost portion of the PCA.

Management Rank Comments: Current management seems to favor persistence of the elements in the PCA, but management actions may be needed in the future to maintain the current quality of the element occurrences. Management programs for control of weeds and simulation of large-scale natural processes, such as fire and herbivory, are implemented within portions of the PCA and these practices utilized throughout the rest of the PCA would benefit the elements.

TRINIDAD

Biodiversity Rank: B2 (Very high significance)
This PCA contains all precise locations known of Single-head Goldenweed (*Oonopsis foliosa* var. *monocephala*) (G3G4T2) in the world. There is also an excellent (A rank) occurrence of the apparently globally secure (G4) black-tailed prairie dog (*Cynomys ludovicianus*).

Protection Urgency Rank: P2 (High urgency)
Part of this site is located within the Pinyon Canyon maneuver site of the U.S. Army and is threatened by army maneuvers.

Management Urgency Rank: M3 (Moderate urgency)
New management actions may be needed within 5 years to maintain the current quality of the rare plant population (Single-head Goldenweed). It is unknown how this species responds to disturbance. Army maneuvers on the U.S. Army property may threaten some plants.

Location: The Trinidad PCA is located in central Las Animas County. The west edge of this PCA is only 0.5 miles east of Trinidad, Colorado on Highway 360, which bisects the PCA.

Associated BLM Parcel(s): Contains La2 and La4, and is near La3.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s)

Brown Sheep Camp,
Earl,
Hoehne
Lambing Spring,
Ludlow,
Model,
Vega Corral,
Mooney Hill
Paterson Crossing,
Seven Lakes Reservoir,
Trinidad East,
The Hogback,
Tyrone,

T30S R60W Sections 2-35;
T30S R61W Sections 1-36;
T30S R62W Sections 1, 7-36
T30S R63W Sections 13-22, 28-36;
T31S R60W Sections 4-10, 15-22, 31-33
T31S R61W Sections 1-36;
T31S R62W Sections 1-36;
T31S R63W Sections 1-36;
T31S R64W Sections 1-3, 9-16, 21-27, 35-36;
T32S R60W Sections 4-9, 16-20, 29-32
T31S R61W Sections 1-36;
T31S R62W Sections 1-36;
T31S R63W Sections 1-36;
T31S R64W Sections 1, 2, and 12;
T32S R60W Sections 5-8;
T31S R61W Sections 1-24, 27-33;
T31S R63W Sections 1-18, 22-25;
T31S R63W Sections 1-5, 9-14.

Size: 276,550 acres (111,916 ha)
Elevation: 5,610 to 6,135 feet to 1,870 m)

Site Description: This is a large site dominated by shortgrass prairie, greasewood flats, and Frankenia habitats. There are many county roads, which dissect this site and support a variety of exotic plant species. Shortgrass prairie characterizes the site, and some of the more common graminoids include buffalograss, needle and thread, Indian ricegrass and galleta. Bitterbrush,

yucca, greasewood, prickly pear cactus, scarlet globemallow dominates the forb layer. The soils are generally of clay loam. This PCA contains all of the currently known locations for the Single-head Goldenweed (*Oonopsis filiosa*). The PCA also contains a large colony of black-tailed prairie dogs with over 150 individuals observed on the colony in 2003. Approximately one third of the observed prairie dogs were young of the year.

Natural Heritage element occurrences at the Trinidad PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Oonopsis foliosa* var. *monocephala	**Single-head Goldenweed**	**G3G4T2**	**S2**				**B**
Oonopsis foliosa var. *monocephala*	Single-head Goldenweed	G3G4T2	S2				B
Oonopsis foliosa var. *monocephala*	Single-head Goldenweed	G3G4T2	S2				B
Oonopsis foliosa var. *monocephala*	Single-head Goldenweed	G3G4T2	S2				H
Cynomys ludovicianus	Black-tailed prairie dog	G4	S4	C	SC		A

*EO Rank is "Element Occurrence" Rank

** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: This PCA contains all precise locations known of Single-head Goldenweed (*Oonopsis foliosa* var. *monocephala*) (G3G4T2) in the world. There is also an excellent (A rank) occurrence of the apparently globally secure (G4) black-tailed prairie dog (*Cynomys ludovicianus*).

Boundary Justification: This PCA encompasses all the precise locations known for *Oonopsis foliosa* var. *monocephala* in the world. The occurrences were all documented from the roads, however it is suspected that the plants continue into the natural vegetation. The site boundary encompasses what is currently believed to be the extent of this species range. Although the boundaries were not developed for vertebrates, the site does encompass historical and/or general occurrences of the Red-headed woodpecker, Ferruginous hawk, Mountain plover and the Black-footed ferret.

Protection Rank Comments: The area surrounding the Neeskah PCA is a mix of private ranchland and BLM property with the majority being State Lease land. There are no special threats to this area as cattle grazing is not detrimental to any species within the PCA. However, There are only three records of breeding Piping Plover areas in Colorado. CNHP's database records only eight Western Snowy Plover breeding areas and the Colorado Breeding Bird Atlas identifies only seven (all overlapping CNHP's localities). The Neeskah PCA offers unique opportunities for conserving habitat of two birds of conservation significance in Colorado through a conservation easement with the current landowner or purchase and protection of the area if the landowner is willing.

Management Rank Comments: New management actions may be needed within 5 years to maintain the current quality of the rare plant population (Single-head Goldenweed). It is unknown how this species responds to disturbance. Cattle grazing is predominant through most of this site. Plants should be monitored for effects. Army maneuvers on the U.S. Army property

may threaten some plants. Exotic plant species are abundant along the roads and should not be allowed to spread. There are numerous roads, telephone lines, and power lines dissecting the site.

B3 POTENTIAL CONSERVATION AREAS

GOTERA CANYON

Biodiversity Rank: B3 (High significance)
This PCA contains an excellent (A rank) occurrence of the Desert Shrubland (*Nolina texana*), which is the highest ranked occurrence of this natural community in Colorado.

Protection Urgency Rank: P3 (Moderate urgency)
Protection actions may be needed, but probably not within the next 5 years.

Management Urgency Rank: M3 (Moderate urgency)
New management actions may be needed within 5 years to maintain the current quality of the element occurrences in the PCA. Some of the grasslands along the canyon floor are heavily utilized. Severe damage could result if there is not some restoration efforts within the next decade.

Location: The Gotera Valley PCA is located in southeastern Las Animas County on the Spool Ranch. From the Spool Ranch headquarters, continue north on Cobert Canyon Road until the fence around the Cotton Mesa Ranch must be avoided. Go south around the fence (through two gates) to the western edge of the property, but instead of continuing west up Cobert Canyon, go north along the Cotton Mesa fence, over a ridge, and down to the mouth of Gotera Canyon. The site continues for the next four miles up canyon.

Associated BLM Parcel(s): Near La9.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s): Corbett Mesa North,
T34S R55W Sections 21, 22, 26-28, 34-36;
T35S R55W Sections 2 and 3.

Size: 1,501 acres (607 ha)
Elevation: 5,000 to 5,700 feet (1,524 to 1,737 m)

Site Description: Gotera Canyon dissects the highest portion of Mesa de Maya; however, this site is the lower of two canyon reaches. The stream is ephemeral but with permanent pools. The mouth of the canyon is a weedy grassland bordered by canyon slopes of shrubs and grasses on the north and woodland to forest on the south. The woods are pinyon and juniper with scattered oak. The shrubs and grasses include *Nolina texana*, a rare community. Moving upstream the canyon quickly narrows. There are numerous old adobe and rock houses from past inhabitants. Cattle heavily utilize most of the bottomlands and benches, but the slopes are of high quality. Patches of cottonwoods are found along the stream corridor, particularly where there are springs. Some of the springs have deep holes with amphibians and numerous aquatic insects. Higher in the canyon the walls close in forming a spectacular environment. Oak trees and shrubs adorn the walls along with the usual amount of juniper. Springs or pools become more common. Side canyons are evident and often form spectacular rock walls. There is a dirt road through the canyon, which is in reasonable condition for trucks and 4 x 4's. At the upper end of the site, the

canyon opens onto a bench where grasslands dominate the habitat. At this point, the cooler areas have Ponderosa pine, some rather large. The canyon is small, but spectacular. The area provides a cooler environment than much of the surrounding landscape and is diverse in its animals and plants.

The Mesa de Maya area is a part of the shrub-steppe ecoregion, thereby having an arid, but cool climate. Summers are often very hot (at least several days of greater than 100 degrees F) and the winters cold. The same environment has challenged ranchers and farmers for centuries. Blizzards and thunderstorms can be severe. Standing moisture is uncommon and flash-flooding readily occurs during heavy storms and the streams are indicators of flash-flood systems. The same environment has challenged ranchers and farmers for centuries.

There are excellent signs of prehistoric peoples inhabiting the region. Gotera Canyon is very near the type locality of the Folsom Man. These early hunter-gatherers inhabited the region as much as 11-12,000 years ago. Native Americans of many tribes followed in the area. The Mesa de Maya was a part of the Spanish territory; therefore, it is no surprise to find many relict homesites from that era. After the Indians were removed from the area, large-scale ranching activities dominated the lands. This activity has continued to this day. Mesa de Maya is off the beaten path and presents many challenges to making a living. These factors have preserved much of the old way of life and a healthy ecosystem at the same time. There are numerous Native American, Mexican, and early American sites on the Spool Ranch and adjacent Loudon Ranch. There is at least one historic cemetery, perhaps dating back to the Mexican domination.

Natural Heritage element occurrences at the Gotera Canyon PCA.

Element	**Common Name**	**Global Rank**	**State Rank**	**Federal Status**	**State Status**	**Federal Sensitive**	**EO Rank***
Nolina texana	Desert Shrubland	GU	S1				A
Cheilanthes standleyi	Standley's Cloak Fern	G4	S1				E
Cheilanthes standleyi	Standley's Cloak Fern	G4	S1				
Asclepias macrotis	Long-hood Milkweed	G4	S2				BC
Asclepias oenotheroides	Zizotes Milkweed	G4G5	S1				B
Sarcostemma crispum	Twinevine	G4G5	S1				
Pellaea wrightiana	Wright's Cliff-brake	G5	S2				AB
Pellaea wrightiana	Wright's Cliff-brake	G5	S2				BC
Lomatium foeniculaceum ssp. macdougalii	Desert-parsley	G5T4T5	S1				D
Juniperus monosperma-(Pinus edulis)/Cercocarpus montanus/Schizachyrium Scoparium	Foothills Pinyon-Juniper Woodlands	GU	SU				

*EO Rank is "Element Occurrence" Rank
** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: This PCA contains an excellent (A-rank) occurrence of the Desert Shrubland (*Nolina texana*), which is the highest ranked occurrence of this natural community in Colorado. There are also several good occurrences of plant species, which are critically imperiled in the state. The plants species include Standley's Cloak Fern (*Asclepias macrotis*), Zizotes Milkweed (*A. oenotheroides*), Wright's Cliff-brake *(Pellaea wrightiana*), Standley's

Cloak Fern (*Cheilanthes standleyi*), Desert-parsley (*Lomatium foeniculaceum*), and Twinevine (*Sarcostemma crispum*).

Boundary Justification: The boundary includes the entire reach of lower Gotera Canyon, the canyon walls, and a buffer on the rim. All side canyons are also included. The mouth of the canyon is included from lip to lip. All biological elements that are targeted in this site are canyon-dwellers or are limited in distribution by the availability of water.

Protection Rank Comments: Protection actions may be needed, but probably not within the next 5 years. The threats to the land are dependent on the current ownership. Good land stewards will not destroy the landscape. Should the ranch turn over to a less than caring owner, there could be severe damage to Gotera Canyon. The most sensitive habitats are, of course, the watering holes.

Management Rank Comments: New management actions may be needed within 5 years to maintain the current quality of the element occurrences in the PCA. Some of the grasslands along the canyon floor are heavily utilized. Severe damage could result if there is not some restoration efforts within the next decade. This canyon has apparently been used for livestock grazing for many years. Undoubtedly, the condition of the range has improved. Homesteaders or earlier dwellers must have attempted subsistence agriculture and grazing to some degree. Today, the entire region is used almost solely for livestock and hay. There are relatively few exotic species on the entire ranch. Nonetheless, cheatgrass (*Bromus tectorum*) is present, as is tamarisk (*Tamarix pentandra*) (albeit in very small amounts). There are aoudad on the adjacent ranch. None are known to be outside of their fenced area. Inventory of the areas natural resources is highly fragmented at this time. There is clearly an abundance of state-rare species and the natural communities are poorly described. The canyon is extremely narrow and therefore, provides little grazing, but the water holes are of good quality. The canyon could use a rest for some period to let the grasslands recover.

GOTERA RINCON

Biodiversity Rank: B3 (High significance)
This PCA contains a good (B rank) occurrence of a globally rare (G2) natural community.

Protection Urgency Rank: P4 (Low urgency)
No protection actions are needed in the foreseeable future.

Management Urgency Rank: M3 (Moderate urgency)
As with most lands in this area, there is some need to improve grazing management prescriptions.

Location: The Gotera Rincon PCA is located in south-central Las Animas County. To reach this PCA from Branson, Colorado, take Highway 85 north to Highway 160 and follow 160 west approximately 4 miles to County Road 147. Continue south on 147 for approximately 7 miles to County Road 10 and take it east for approximately 9.5 miles to the west edge of the PCA.

Associated BLM Parcel(s): Contains La8, and is near La16.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s): Corbett Mesa North and Pine Canyon,
T34S R55W Sections 5-9, 16-21;
T34S R56W Sections 10-15, 23- and 24.

Size: 6,027 acres (2,439 ha)
Elevation: 5,774 to 6,364 feet (1,760 to 1,940 m)

Site Description: This PCA is located in southeastern Las Animas County, on the Mesa de Maya, approximately six miles from the New Mexico state line. The PCA is characterized by pinyon-juniper woodland, with an associated understory predominately composed of shrubs such as, oak (*Quercus gambellii*, yucca (*Yucca glauca*), mountain mahogany (*Cercocarpus montanus*), prickly pear (*Opuntia* sp.) and skunkbrush (*Rhus trilobata*). Blue grama (*Bouteloua gracilis*) and side-oats grama (*Bouteloua curtipendula*) dominate the graminoid layer. The aspect varies, but trends to the southeast with 6-20% slopes. Shallow, rocky clay loam soils are found on the site, which also contains some exposed rim rock. This PCA contains an unranked Scarp Woodlands (*Juniperus scopulorum/Cercocarpus montana-Rhus trilobata*) community.

Natural Heritage element occurrences at the Gotera Rincon PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Andropogon gerardii-Schizachyrium scoparium	**Xeric Tallgrass Prairie**	**G2?**	**S2**				**B**
Juniperus scopulorum/Cercocarpus montanus-Rhus trilobata	Scarp Woodlands	GU	SU				B

*EO Rank is "Element Occurrence" Rank
** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: This PCA contains a good (B rank) occurrence of the globally rare (G2?) Xeric Tallgrass Prairie natural community. There is also a good (B rank) occurrence of the unranked (GU) Scarp Woodlands natural community.

Boundary Justification: This PCA was drawn to protect two good condition natural community element occurrences. The boundary includes the entire reach of the middle portion of Gotera Canyon, the canyon walls including those on the east side of Cobert Canyon, and the tallgrass prairie on Mesa de Maya lying between Cobert and Gotera canyons. All side canyons are also included. All biological elements that are targeted in this site are canyon-dwellers or are limited in distribution by the availability of water.

Protection Rank Comments: No protection actions are needed in the foreseeable future.

Management Rank Comments: There are high wildlife values on the Mesa de Maya. The area has been used for livestock grazing for more than 100 years and there are no special offsite concerns since livestock grazing dominates the entire region. There has been no recent inventory of this area. Moreover, there is only the poorest of records of animals. There is high potential for Mesa de Maya proper, but particularly for the highest elevation areas. There is a need to develop a less intrusive water supply. Many drainages have be dammed for water.

HORSE CREEK RESERVOIR

Biodiversity Rank: B3 (High significance)
The Horse Creek Reservoir PCA contains an unranked, historical occurrence of the globally rare (G2) Mountain Plover (*Charadrius montanus*).

Protection Urgency Rank: P2 (High urgency)
It is likely that the Bald Eagle is no longer nesting at Horse Creek Reservoir, however, the breeding records of both Mountain and Western Snowy plover offer unique opportunities for conserving habitat, either through a conservation easement with the current landowner or outright purchase and protection, of two birds of conservation significance in Colorado.

Management Urgency Rank: M4 (Low urgency)
Current management seems to favor the persistence of the zoological elements on this site, but new management actions may be needed in the future to maintain the current quality and mosaic of these occurrences.

Location: The Horse Creek Reservoir PCA is located on the Otero Las Animas county line in extreme northeast Otero County. To reach the PCA, take Highway 194 east from Las Animas for approximately 9.8 miles to County Road HH and follow it east for approximately 5 miles to County Road 32. Follow 32 north 3 miles and go east on CR LL for 1 mile and go north and east on CR 33 for 6.5 miles to the PCA's northwest boundary.

Associated BLM Parcel(s): Contains Be17.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s): Lewis Ranch,
T21S R53W Sections 19, 29-31;
T22S R53W Sections 6 and 7;
T21S R54W Sections 25, 35 and 36;
T22S R54W Sections 1, 2, 11 and 12.

Size: 2,968 acres (1,201 ha)
Elevation: 4,134 feet (1,260 m)

Site Description: Horse Creek Reservoir is a high plains reservoir on the central shortgrass prairie that provides nesting habitat for shorebirds and serves as a winter roost for raptors. In dry years this large reservoir can sometimes be filled to only 25% of its capacity. Salt Cedar has grown up along the reservoirs shoreline and the shallows of the west end have supported nesting sites of Western Snowy Plover, Mountain Plover, Killdeer and Avocets. The Reservoirs western area contains a large alkaline flat along its lowest point where the lakebed is surrounded by forbs and grasses. The majority of past nesting has occurred in one area on the west end, north side, which consists of sand-alkali flats with patches of cattails (*Typha*) and bulrushes (*Scirpus*). In the prairie around the lake, Mountain Plover and Long-billed Curlew nesting has occurred.

Natural Heritage element occurrences at the Horse Creek Reservoir PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Charadrius montanus	**Mountain Plover**	**G2**	**S2B**		**SC**	**FS/BLM**	**H**
Charadrius alexandrinus nivosus	Western Snowy Plover	G4T3	S1B			FS/BLM	H
Halliaeetus leucocephalus	Bald Eagle	G4	S1B	LT	T		H

*EO Rank is "Element Occurrence" Rank
** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: This PCA contains an unranked, historical occurrence of the globally rare (G2) Mountain Plover (*Charadrius montanus*). There are also historical occurrences of two apparently secure (G4) birds, the Western Snowy Plover (*Charadrius alexandrinus nivosus*) and Bald Eagle (*Halliaeetus leucocephalus*).

Boundary Justification: The PCA boundary includes the reservoir and shoreline with approximately 1000 foot buffer.

Protection Rank Comments: The area surrounding Horse Creek Reservoir is a mix of private ranchland and BLM property with the majority being State Lease land. There are no special threats to this area as cattle grazing is not detrimental to any species within the PCA. However, there are only eight records of breeding Snowy Plover in CNHP's database and the Colorado Breeding Bird Atlas identifies only seven breeding sites (all overlapping CNHP's localities). CNHP's database and the Colorado Breeding Bird Atlas suggest that there are roughly 100 breeding sites for the Mountain Plover in Colorado and both identify the site at Horse Creek Reservoir. This declining grassland bird is a high conservation priority in Colorado. It is likely that the Bald Eagle is no longer nesting at Horse Creek Reservoir, however, the breeding records of both Mountain and Western Snowy plover offer unique opportunities for conserving habitat, either through a conservation easement with the current landowner or outright purchase and protection, of two birds of conservation significance in Colorado.

Management Rank Comments: Grazing in association with disturbance by prairie dogs is considered beneficial to mountain Plover, which prefer low vegetation with approximately 30% of the nesting area covered in bare ground. Burning of grassland is beneficial to Mountain Plover and attracts both wintering and breeding populations. Restricting new construction for gas and oil exploration, wind-power development, and water well drilling from April through June is beneficial to breeding Mountain Plover. Western Snowy Plover are sensitive to human intrusion, which may cause increased clutch losses. Greater public awareness and protection from human disturbance from June through July would benefit nesting Snowy Plover.

Water level should be monitored and kept at levels suitable for the elements located in this site. Adverse impact from roads and recreation activities should be evaluated and mitigated.

RIVERSIDE RESERVOIR

Biodiversity Rank: B3 (High significance)
The biodiversity rank is based on a good (B-ranked) occurrence of a globally vulnerable (G3) American White Pelican breeding colony.

Protection Urgency Rank: P2 (High urgency)
There is an opportunity for protection of the element occurrence at this PCA within five years. The American White Pelican colony at Riverside Reservoir offers a unique opportunity to conserve breeding populations of this pelican in Colorado either through a conservation easement with the current landowner or outright purchase and protection of the nesting site.

Management Urgency Rank: M4 (Low urgency)
Although not currently threatened, future management to maintain the current quality of element occurrences may be needed. Greater public awareness and protection from human disturbance from March through June would benefit the breeding colony.

Location: Riverside Reservoir is located in east-central Weld County approximately 11.5 miles from Wiggins Colorado. To reach the PCA from I76 at Wiggins, take Highway 34 approximately 10 miles to County Road 87. Follow 87 approximately 2.5 miles to turn in road and the reservoir is one mile to the east.

Associated BLM Parcel(s): Near We2.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s): Dearfield. T4N R62W Sections 1 and 12.

Size: 190 acres (77 ha)
Elevation: 4,500 feet (1,372 m)

Site Description: Partially vegetated islands in Prairie Reservoir. The important feature of this PCA is the island within Riverside Reservoir, which has acted as a nesting site for a colony of White Pelicans, *Pelecanus erythrorhynchos*, although none were observed June of 2003. The reservoir has steep, disturbed slopes and due to dam seepage, some ribbon communities of cottonwood exist, with an occasional interspersed locust, along the reservoir's shoreline. Cheatgrass dominates the remainder of the upland habitat. There is a northeast aspect with gentle slopes, except for the steep incline around the dam. Sandy loam underlies the highly disturbed soils of the PCA. The reservoir and associated riparian fringe provides habitat for many other species of wildlife.

Natural Heritage element occurrences at the Riverside Reservoir PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Pelecanus erythrorhynchos	**American White Pelican**	**G3**	**S1B**		**SC**	**BLM**	**A**

*EO Rank is "Element Occurrence" Rank
** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: This site contains a good (B-ranked) occurrences of an American White Pelican breeding colony, which are vulnerable (G4) on a global scale and rare (S1B) in the Colorado.

Boundary Justification: The boundary the islands in their entirety of islands and a quarter-mile buffer on open water.

Protection Rank Comments: The area surrounding Riverside reservoir is a mix of State Lease land and BLM property with the majority being private ranchland. There are no special threats to this area as cattle's grazing is not detrimental to continued existence of the nesting colony. However, there are only seven records of breeding pelican colonies in CNHP's database and four of these are in urban areas and may no longer exist as is indicated by the Colorado Breeding Bird Atlas data, which identifies only three of the colonies recorded by CNHP. The colony at Riverside Reservoir offers a unique opportunity to conserve breeding populations of this pelican in Colorado either through a conservation easement with the current landowner or outright purchase and protection of the nesting site.

Management Rank Comments: American White Pelican breeding colonies are highly sensitive to human intrusion, which cause desertions, especially during courtship and early incubation (March through May). Greater public awareness and protection from human disturbance from March through June would benefit the breeding colony.

B4 POTENTIAL CONSERVATION AREAS

CIMARRON VALLEY SITE

Biodiversity Rank: B4 (Moderate significance)
This PCA contains an unranked occurrence of the globally vulnerable (G3) Lesser Prairie Chicken (*Tympanuchus pallidicinctus*).

Protection Urgency Rank: P2 (High urgency)
The Cimarron Valley PCA offers a unique opportunity for conserving habitat important to the continued viability of a bird of conservation significance in Colorado through a conservation easement with the current landowner or purchase and protection of the area if the landowner is willing.

Management Urgency Rank: M4 (Low urgency)
Current management seems to favor the persistence of the zoological elements on this site, but new management actions may be needed in the future to maintain the current quality and mosaic of these occurrences.

Location: This PCA is located in southeastern Baca County in the extreme southeastern corner of Colorado. The easiest way to access this PCA is through Kansas. From Highway 287 approximately 3.75 miles north of Campo, Colorado go east into Kansas on County Road M, which becomes Highway 52. At the Highways 51 and 27 Junction go south on 27 to county road approximately one mile north of Elkhart, Kansas and follow this road back into Colorado to County Road D and the PCA.

Associated BLM Parcel(s): Near Ba6, Ba7, Ba8 and Ba9.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s): Midway SE and Midway SW,
T34S R41W Section 19, 30 and 31;
T34S R42W Sections 23-27, 33-36;
T35S R42W Sections 1-5, 8-12, 14-17.

Size: 9,219 acres (3,731 ha)
Elevation: 3,510 to 3,904 feet (1,070 to 1,190 m)

Site Description: The Cimarron Valley Site is within the Inter-Mountain Basins Active and Stabilized Dunes ecological system and is characterized as a Sand Dune Shrub complex in the Colorado Vegetation Gap layer. This vegetation type commonly sandsage (*Artemisia filifolia*) shrubland with junegrass (*Kolaria macrantha*), sand dropseed (*Sporobolus cryptandrus*) and buffalograss (*Buckloe dactyloides*) in the graminoid layer.

Natural Heritage element occurrences at the Cimarron Valley Site PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Tympanuchus pallidicinctus	**Lesser Prairie Chicken**	**G3**	**S2B**	**C**	**T**	**FS**	**E**

*EO Rank is "Element Occurrence" Rank
** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: This PCA contains an unranked occurrence of the globally vulnerable (G3) Lesser Prairie Chicken (*Tympanuchus pallidicinctus).*

Boundary Justification: The PCA boundary includes the known occurrence and potential habitat for the Lesser Prairie Chicken with at least a 0.5 kilometer buffer.

Protection Rank Comments: The PCA and surrounding area is privately owned and actively grazed ranchland. There are 67 records of Lesser Prairie Chickens in CNHP's database. This corresponds to approximately nine production areas as defined by the Colorado Division of Wildlife. The Cimarron Valley PCA represents one of these nine production areas and offers a unique opportunity for conserving habitat important to the continued viability of a bird of conservation significance in Colorado through a conservation easement with the current landowner or purchase and protection of the area if the landowner is willing.

Management Rank Comments: Current management seems to favor the persistence of the Lesser Prairie Chicken in the PCA, but management actions may be needed in the future to maintain the current quality of this production area. Internal fragmentation would probably contribute to the unsuitability of areas within the PCA as human structures (oil, gas and water wells, roads, powerlines, and buildings) reduce the use of otherwise suitable habitat. Scientific research suggests that Lesser Prairie Chickens use areas with less anthropogenic disturbance and the activities listed above have the potential to have deleterious effects to the resident prairie chicken population. Declines of prairie chicken populations continue due to habitat loss, as a result of grass and rangeland conversion to cropland. Maintaining sagebrush density and cover will be important to successful nesting and brood rearing of this population and loss of from 50 to 70% of the shrubs within the PCA has the potential to adversely affect this population's viability.

TWO BUTTES RESERVOIR

Biodiversity Rank: B4 (Moderate significance)
This PCA contains a fair (C rank) occurrence of the globally vulnerable (G3S3) Colorado Green Gentian (*Frasera coloradensis*). Overall, this is a very degraded PCA.

Protection Urgency Rank: P2 (High urgency)
Protection actions may be needed within 5 years. It is estimated that stresses from recreation and to a lesser extent grazing may reduce the viability of the elements in the PCA if protection is not taken. The northern portion of this PCA is part of the Two Buttes Reservoir State Wildlife Area offering opportunities for management.

Management Urgency Rank: M3 (Moderate urgency)
New management actions may be needed within 5 years to maintain the current quality of the element occurrences in the PCA. Management of recreation and grazing is needed. These activities have potential for deleterious effects on the riparian woodland and the occurrence of the Colorado Green Gentian.

Location: The PCA is at Two Buttes Reservoir in Baca County approximately 9 miles due northwest of the town of Two Buttes, Colorado. From Two Buttes take 116 west to Highway 287 and follow 287 north for approximately 4 miles to County Road W. Follow CR W east for approximately 3 miles to the PCA.

Associated BLM Parcel(s): Contains Ba3 and Ba4, and is near Ba2.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s): Horse Creek Springs and Two Buttes Reservoir.
T27S R46W Sections 32-36;
T28S R45W Section 6;
T28S R46W Sections 1-5, 10-12.

Size: 3,850 acres (1,558 ha)
Elevation: 4,133 to 4,427 feet (1,260 to 1,380 m)

Site Description: Two Buttes Reservoir, the surface water of which fluctuates with rainfall, dominates this PCA. At the time of the 2003 visit the reservoir was dry, except for the area immediately upstream of the dam where there is a stand of Plains Cottonwood Riparian Woodland ((*Populus deltoides ssp. Monilifera-(Salix amygdaloides)/Salix exigua*)). There are many ruderal species in this PCA probably resulting from the disturbance associated with the reservoir and its campsite. There is a fair amount of cottonwood cover along the shoreline, with shortgrass prairie and interspersed shrubs occupying the majority of the upland portion of the PCA. Red-three awn, buffalograss, black grama, yucca, and slimflower scurf-pea dominate the upland growth forms. Slopes of the PCA vary from 2-10% and sandy loam soils are dominant within the PCA. In other parts of the PCA the plant community is shrubland, dominated by sand sagebrush and yucca. In these areas western wheatgrass and cheatgrass dominate the graminoid layer, while kochia is the dominant forb.

This PCA was drawn for great Plains Mixed Grass Prairie (*Schizachyrium scoparium-Bouteloua curtipendula*), but this was not the dominant vegetative type in 2003. The Colorado Green Gentian (*Frasera coloradensis*) is also recorded from the PCA, but was not observed in 2003. There is also an old Bald Eagle nest recorded within this PCA, which also was not observed in 2003. A large black-tailed prairie dog colony of over 200 individuals lies just east of the reservoir and PCA in an area of shortgrass prairie dominated by buffalograss and three-awn.

Natural Heritage element occurrences at the Two Buttes Reservoir PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Frasera coloradensis	**Colorado Green Gentian**	**G3**	**S3**			**FS**	**C**
Schizachyrium scoparium-Bouteloua curtipendula	Plains Mixed Grass Prairie	G3	S2				CD
Populus deltoides ssp. Monilifera-(Salix amygdaloides)/Salix exigua	Plains Cottonwood Riparian Woodland	G3G4	S3				C
Halliaeetus leucocephalus	Bald Eagle	G4	S1B	LT	T		H

*EO Rank is "Element Occurrence" Rank

** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: This PCA contains a fair (C rank) occurrence of the globally vulnerable (G3S3) Colorado Green Gentian (*Frasera coloradensis*). Also occurring within the PCA are two natural communities that are vulnerable in Colorado, the Plains Mixed Grass Prairie (*Schizachyrium scoparium-Bouteloua curtipendula*) and the Plains Cottonwood Riparian Woodland (*Populus deltoides ssp. Monilifera-(Salix amygdaloides)/Salix exigua*). Overall, this is a very degraded PCA.

Boundary Justification: The boundary includes known element occurrences and some potential habitat with at least a 0.5 kilometer buffer.

Protection Rank Comments: Protection actions may be needed within 5 years. It is estimated that stresses from recreation and to a lesser extent grazing may reduce the viability of the elements in the PCA if protection is not taken. The area north of the reservoir is a State Wildlife Area with heavy recreational use (hunting and fishing). This activity along with the campground has degraded the PCA from its pristine state, but the fact that it is a State Wildlife Area offers opportunities for management. In 1991 the site was rejected by the Colorado Natural Areas Inventory as a State Natural Area

Management Rank Comments: New management actions may be needed within 5 years to maintain the current quality of the element occurrences in the PCA. Management of recreation and grazing is needed. These activities, particularly the recreation, have potential for deleterious effects on the riparian woodland and the occurrence of the Colorado Green Gentian. The area does not appear to be grazed much, if at all. The *Frasera coloradensis* seems to thrive on disturbance short of complete trampling and the riparian woodland, although degraded, persists. The high recreational use, however, has probably resulted in the Bald Eagle abandoning the PCA as a nesting site.

WEST OF ADOBE CREEK

Biodiversity Rank: B4 (Moderate significance)
This PCA supports a fair (C rank) occurrence of the globally vulnerable (G3) Plans Ragweed (*Ambrosia linearis*).

Protection Urgency Rank: P2 (High urgency)
Protection actions may be needed within 5 years. It is estimated that stresses may reduce the viability of the plains Ragweed in the PCA within this approximate timeframe. Protect from road construction activities.

Management Urgency Rank: M2 (High urgency)
New management actions may be needed within 5 years to prevent the loss of the element occurrences in the PCA. Protect occurrence from road maintenance and other roadside activities.

Location: The Adobe Creek PCA is located in Lincoln County approximately 20 miles northwest of the town of Kiowa. The PCA is approximately 3.5 miles east of the end of Road 32 (between roads J and K). Two track roads lead into the PCA. Also, this PCA lies completely within the Adobe Creek PCA boundary.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s): Hubbard Lake and Karval; T16S R54W Sections 7 and 18.

Associated BLM Parcel(s): Near Li2, Li3, Li4 and Li5.

Size: 300 acres (121 ha)
Elevation: 4,133 to 4,427 feet (1,260 to 1,380 m)

Site Description: The area of the PCA includes herbaceous rangeland with some areas co-dominated by grasses and forbs, while others are dominated by perennial and annual grasses. Species can include among others Arrowleaf balsamroot (*Balsamorhiza sagittata*), needle and thread grass (*Stipa comata*), galleta grass (*Hilaria jamesii*), junegrass (*Kolaria macrantha*), and western wheatgrass (*Pascopyrum smithii*). The land drops approximately 200 feet over a two mile distance from the top of the plateau to Adobe Creek where the PCA runs along the creek. A road bisects the PCA.

Natural Heritage element occurrences at the Two Buttes Reservoir PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Ambrosia linearis	**Plains Ragweed**	**G3**	**S3**			**FS**	**C**

*EO Rank is "Element Occurrence" Rank
** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: This PCA supports a fair (C rank) occurrence of the globally vulnerable (G3) Plans Ragweed (*Ambrosia linearis*).

Boundary Justification: Boundary is drawn to protect the occurrence from direct impacts. A buffer is drawn to provide the element with suitable habitat where additional individuals can become established over time. In general, the boundary is not ecological in nature as this rare plant species tends to follow roads, and the site boundary reflects this pattern.

Protection Rank Comments: Protection actions may be needed within 5 years. It is estimated that stresses may reduce the viability of the plains Ragweed in the PCA within this approximate timeframe. The population of Plains Ragweed occurs near the county road and protecting the rare plant from road maintenance and widening, grading, widening, and weed spraying will be important to the long term viability of the population.

Management Rank Comments: New management actions may be needed within 5 years to prevent the loss of the element occurrences in the PCA. Road maintenance and other roadside activities have the potential to adversely affect the ragweed occurrence and proper management of these activities would benefit the population.

B5 POTENTIAL CONSERVATION AREAS

ADOBE CREEK

Biodiversity Rank: B5 (General Significance)
This PCA contains a good (B rank) occurrence of the globally secure (G4/S4) black-tailed prairie dog (Cynomys ludovicianus) and an excellent (A-ranked) occurrence of the globally vulnerable (G3/S3) swift fox (Vulpes velox).

Protection Urgency Rank: P4 (Low urgency)
No protection actions are needed in the foreseeable future.

Management Urgency Rank: M4 (Low urgency)
Although not currently threatened, future management to maintain the current quality of element occurrences may be needed.

Location: The Adobe Creek PCA is located in Lincoln County approximately 20 miles northwest of the town of Kiowa. The PCA is approximately 3.5 miles east of the end of Road 32 (between roads J and K). Two track roads lead into the site.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s): Hubbard Lake and Scott Draw. T16S R54W Sections 20, 27-29, 33, 34.

Associated BLM Parcel(s): Contains Li3, Li5 and Li6, and portions of Li2 and Li4.

Size: 1703 acres
Elevation: 4,613 to 4,698 feet

Site Description: This PCA, located in south central Lincoln County, is very flat to slightly rolling with few shrubs and forbs, except for scattered *Opuntia* sp. Shortgrass Prairie is the dominant community and the dominant graminoids include buffalo grass, blue grama, and side-oats grama. In some areas of the PCA many ruderal species are present, probably due to some plowed agricultural fields near the PCA. The PCA and surrounding area is historic ranchland that is currently grazed by both horses and cattle.

Two black-tailed prairie dog colonies occur within the PCA. Slopes vary within the PCA, but are minimal, ranging from 0-8%, and with the sandy loam soils the habitat of the PCA represents from good to excellent prairie dog habitat. Some other animals observed at the site include horned lark, swift fox and burrowing owl.

Hydrological processes do not appear to have been altered at this site.

Natural Heritage element occurrences at the Adobe Creek PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Cynomys ludovicianus	**Black-tailed prairie dog**	**G4**	**S4**				**B**

Cynomys ludovicianus	Black-tailed prairie dog	G4	S4				B
Vulpes velox	Swift Fox	G3	S3	C	SC	C	A
Athene cunicularia	Burrowing Owl	G4	S4B			FS	-

*EO Rank is "Element Occurrence" Rank

** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: This PCA contains a good (B rank) occurrence of the globally secure (G4/S4) black-tailed prairie dog (Cynomys ludovicianus) and an excellent (A rank) occurrence of the globally vulnerable (G3/S3) swift fox (Vulpes velox). The area is excellent habitat for the swift fox with rolling topography and the creek drainage offering a landscape within which a fox could conceal itself. In addition the prairie dog colonies within the PCA offer a secure prey base for the fox population.

Boundary Justification: The PCA boundary includes the entire extent of the black-tailed prairie dog complex including the suitable grasslands interspersed among the separate colonies that form the complex. The boundary is intended to represent the area needed to protect the prairie dog population and allow for suitable areas into which the population can expand.

Protection Rank Comments: No protection actions are needed in the foreseeable future. The area is private ranchland and the locations remoteness limits other potential uses of the land.

Management Rank Comments: Current grazing practices and management actions by the landowner favor persistence of the prairie dogs in the PCA, but management actions may be needed in the future to maintain the current quality of the element occurrence.

Actions of the current landowner must continue or the prairie dog complex could be lost or irretrievably degraded within one year. The current practices of the landowner are beneficial to the continued existence of the prairie dog complex, but any changes in activity such as implementation of a poisoning or other eradication program could cause extirpation of this population within one or two breeding seasons. The continued grazing of livestock will probably have no detrimental impacts on the prairie dogs, which traditionally occur in association with livestock (Kotliar et al. 1999). Research to identify whether this population of prairie dogs has been exposed to plague would assist in understanding the conservation value of this population of prairie dogs.

KING RESERVOIR

Biodiversity Rank: B5 (General significance)
The King Reservoir PCA supports an unranked occurrence of a globally vulnerable (G4T3/S1) bird subspecies.

Protection Urgency Rank: P2 (High urgency)
The King Reservoir PCA offers unique opportunities for conserving habitat of a bird of conservation significance in Colorado through a conservation easement with the current landowner or purchase and protection of the area if the landowner is willing.

Management Urgency Rank: M4 (Low urgency)
Current management seems to favor the persistence of the zoological elements on this site, but new management actions may be needed in the future to maintain the current quality and mosaic of these occurrences.

Location: This PCA is at King Reservoir, which is located approximately 15 miles north of Lamar, Colorado east of Highway 287 on the Prowers and Kiowa county line in extreme northwest Prowers County. To reach the PCA take Highway 287 approximately 9.7 miles north of Wiley, Colorado to County Road C and follow C east for 3 miles to the Neeskah Reservoir and then go south on County Road 46.8 approximately 2.5 miles to King Reservoir.

Legal Description: U.S.G.S. 7.5 minute quadrangle(s): Neenoshe Reservoir,
T20S R47W Section 35,
T21S R47W Sections 1 and 2.

Associated BLM Parcel(s): Contains Pr6, and is near K6.

Size: 379 acres (153 ha)
Elevation: 3,543 feet (1,080 m)

Site Description: The vegetation at the King Reservoir PCA exclusively consists of the graminoids, foxtail barley (*Hordeun jubatum*), alkali sacaton (*Sporobolus airoides*), cheatgrass (*Bromus tectorum*) and rushes (*Juncus* sp.). A very gentle slope drains toward the reservoir and the soils are a clay loam. Snowy Plover have nested in alkali playas along the shore of the reservoir in areas of finer particles (silt/clay) with an alkaline surface layer. There is a large, active colony of black-tailed prairie dogs (*Cynomys ludovicianus*) just east of the site. It is possible that prairie dogs might inhabit the very edge of the site, if the colony were to expand to the xeric vegetation just the PCA.

Natural Heritage element occurrences at the King Reservoir PCA.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO Rank*
Charadrius alexandrinus nivosus	**Western Snowy Plover**	**G4T3**	**S1B**			**FS/BLM**	**H**

*EO Rank is "Element Occurrence" Rank
** Bold type indicates an element occurrence upon which the site rank in based.

Biodiversity comments: The Neeskah PCA contains an excellent (A-ranked) occurrence of the globally vulnerable (G2) Piping Plover (*Charadrius melodus*).. There is also a historical occurrence of the apparently secure (G4) Western Snowy Plover (*Charadrius alexandrinus nivosus*).

Boundary Justification: The PCA boundary includes the reservoir edges that support the nesting areas for the bird species.

Protection Rank Comments: The area surrounding the King Reservoir PCA is a mix of private ranchland and BLM property with the majority being State Lease land. There are no special threats to this area as cattle grazing is not detrimental to any species within the PCA. However, CNHP's database records only eight Western Snowy Plover breeding areas and the Colorado Breeding Bird Atlas identifies only seven (all overlapping CNHP's localities). The King Reservoir PCA offers unique opportunities for conserving habitat of a bird of conservation significance in Colorado through a conservation easement with the current landowner or purchase and protection of the area if the landowner is willing.

Management Rank Comments: The water level of King Reservoir should be monitored and kept at levels suitable for the Western Snowy Plover breeding in the PCA. In addition, inadvertent disturbance of birds and nests by people, dogs, and vehicles are thought to lower reproductive success of Snowy Plover. The adverse impact from roads and recreation activities should be evaluated and mitigated. Western Snowy Plover are sensitive to human intrusion, which may cause increased clutch losses. Greater public awareness and protection against human disturbance from June through July would benefit the Snowy Plover breeding at the King Reservoir PCA.

DISCUSSION

Very few black-tailed prairie dog colonies were found on BLM land within the study area. Colonies only persisted on six of the 93 sites in the two study areas. A fair amount of sites have good and excellent habitat suitability rankings, yet did not contain any colonies. This phenomenon is most likely the result of two main functions. First, a good number of sites are located in areas not conducive to prairie dog habitat. Several sites are found along the riparian fringe of reservoirs or inundated by those reservoirs. These shoreline areas are typically very sandy and support riparian communities, both of which are not preferred by prairie dogs. The same situation is true for sites bisected or in close proximity to the major rivers of the study area. Also, a small number of sites are located in areas such as the Mesa de Maya or canyons in Las Animas County. These areas are characterized by shallow, rocky soils and often times supporting pinyon-juniper communities. These are also habitats not conducive to black-tailed prairie dog colonies (Hoogland 1995 and Koford 1958).

Other factors also contribute to the small amount of colonies found on BLM sites. Sylvatic plague has been documented in Colorado and outbreaks can have an effect on populations many years after the occurrence of the disease (B. Luce, personal communication). If this were to be the case and there are no other metapopulations within a contiguous area of suitable habitat, then a site may never be recolonized by the species. Poisoning of colonies can have similar effects, and is thought to be widespread in eastern Colorado. Many landowners conveyed to CNHP researchers that they actively poison prairie dogs, or have within the last 50 years. Population control most likely does not stop on private land, rather it occurs on BLM property as well. With the warning of the black-tailed prairie dog being afforded federal protection, this phenomenon will likely continue in the future. CNHP researches met few landowners who were indifferent on the subject, and even fewer prairie dog sympathizers.

Landowner interaction remained at a high level during the course of the fieldwork and people maintained different views of the project. Some were very helpful and inquisitive, others were apathetic, and some adamantly denied access to the BLM site. In some cases, landowners were unaware that any BLM land existed within their holdings, while others were interested in acquiring the land. Only a small portion of the sites were officially leased for grazing from the BLM, but cattle were found on the majority of the sites. Few fences existed around the sites, and conditions varied from overgrazed to good condition. Although not often on BLM land, there were a total of 60 Element Occurrences recorded during the course of the work. Black-tailed prairie dogs, burrowing owl, mountain plover, long-billed curlew and swift fox were all observed and recorded during the course of this project.

This year's project differed from the 2002 project (Sovell 2003) in several key elements. The BLM land covered during the 2002 effort was 28,787 acres to only 20,440 acres this year. The majority of the BLM property in the 2002 project was aggregated within four counties and in much larger tracts of land. The sites of this year's project were much smaller and spread throughout the entire eastern part of the state. The study area only contained eight sites larger than 500 acres, however, all but one were associated with a reservoir. This greatly reduced the probability that a large site would have suitable habitat and have a colony present. This also explains why there were much fewer potential conservation areas drawn for the black-tailed

prairie dog. As was previously noted, a fair amount of element occurrences were recorded during the project, except the majority of these were found on private land. However, CNHP's database identifies many Potential Conservation Areas with significant natural resources that either contain or are near BLM parcels within the study area. Indeed, five PCAs discussed are very high in biodiversity significance, four more have high significance, three have moderate significance and there are two PCAs of general interest. The natural resources identified at these PCAs vary from important shore bird breeding areas associated with the reservoirs to grasslands and shrublands that are rare natural communities themselves or support habitat for rare or declining species such as Mountain Plover, Long-billed Curlew, Lesser Prairie Chicken and black-tailed prairie dogs.

Based on the results of these two projects, it is evident that large tracts of property are needed, if the BLM wishes to actively manage black-tailed prairie dogs and many of the other species and natural communities identified by the PCAs discussed in this report. Although this may prove to be logistically difficult, several factors should be kept in mind regarding BLM land tenure and black-tailed prairie dogs in eastern Colorado. It is recommended that small parcels be traded or sold for land that can be aggregated together in close proximity. Second, this land should contain a large percentage of suitable habitat with an active colony already persisting there. And finally, these areas should be located near property owners who do not have antagonistic views toward the species or are participating in a conservation easement program. Taking these issues into account will help to ensure the continued existence and ecological value of a species that once grazed far and wide in eastern Colorado.

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APPENDIX I
BLM Site Summary Information

* Indicates there is a water body at the site, and not all of this acreage was accessible.

Site ID	Survey Date	Picture #	PCA Name	Northing	Easting	Acres	BTPD on BLM (Acreage)	Dominant Community	Distance to BTPD Colony (miles)	Habitat Suitability Ranking	Species List
Ba1	**DENIED ACCESS**			4,158,345	670,271	35	0		>5	poor	
Ba2	6/25/2003	132-133		4,168,268	718,715	23	8	shortgrass prairie	0	excellent	**BTPD**, horned lark, lark bunting, w. meadowlark
Ba3	6/25/2003	135-136		4,166,761	715,472	160*	0	riparian and associated upland (graminoids/forbs/shrubs)	1.2	poor	morning doves, w. kingbirds, cottontails, jackrabbits
Ba4	6/25/2003	131		4,168,150	712,606	36	0	shrubland	1.9	poor	
Ba5	**No Permission**			4,138,859	748,806	17	0		>5	good	
Ba6	6/26/2003	137-138		4,100,016	746,096	35	0	shrubland	1.3	poor	lesser earless lizard, grasshoppers
Ba7	6/26/2003	139-140		4,102,534	746,844	19	0	sand sagebrush shrubland	0.7	poor	w. harvester ants
Ba8	**No Permission**			4,104,531	751,385	7	0		0.7	poor	
Ba9	6/26/2003	141-142		4,105,395	753,572	13	0	cottonwood-willow riparian woodland	2.1	poor	w. kingbird, lark bunting, morning doves
Be1	6/19/2003	120		4,224,315	672,471	397	0	shortgrass prairie	2.5	excellent	w. meadowlark
Be2	6/27/2003	161-162		4,227,317	666,114	77	0	shortgrass prairie	0.3	good	morning dove, w. meadowlark
Be3	7/17/2003	203		4,213,708	646,334	43	0	riparian and associated upland (graminoids/forbs/shrubs)	1.3	fair	
Be4	6/19/2003	120		4,234,699	652,650	320*	0	open water/riparian	3.6	poor	killdeer, bull snake
Be5	6/19/2003	117-118		4,227,294	679,310	216	0	shortgrass prairie	0.2	excellent	killdeer, grasshoppers
Be6	7/16/2003	194-197		4,216,701	688,672	68	0	tamarisk	0.1	poor	morning doves, killdeer, w. box turtle
Be7	8/21/2003	217-218		4,173,169	667,886	42	0	shortgrass prairie	0.3	excellent	morning doves, horned larks, w. harvester ants
Be8	7/15/2003	191-192		4,191,011	642,990	44	0	shortgrass prairie	>5	good	morning doves, dung beetle
Be9	7/15/2003	189-190		4,202,908	641,120	144	0	shortgrass prairie	>5	poor	morning doves, coyote, grasshoppers
Be10	8/21/2003	226		4,180,889	674,300	18	0	shrubland	1	poor	
Be11	8/22/2003	227-228		4,170,305	684,271	82	0	shortgrass prairie	1.5	poor	grasshoppers
Be12	8/22/2003	229-230		4,173,464	678,770	41	0	shortgrass prairie	4	good	horned lark
Be13	8/21/2003	221-222		4,177,017	676,568	63	0	shortgrass prairie	3	poor	morning doves
Be14	8/21/2003	224-225		4,181,473	676,265	20	>1	shortgrass prairie	0	poor	morning doves
Be15	8/22/2003	231-232		4,184,415	677,030	15	0	shrubland	1.2	poor	horned lark
Be16	8/22/2003	233-234		4,188,208	694,349	20	0	shortgrass prairie	2.3	excellent	horned lark

Be17	7/17/2003	204-205		4,225,109	640,316	88	0	open water/riparian	1.5	poor	mule deer (fawn), w. meadowlark
E1	**DENIED ACCESS**			4,277,958	561,721	40	0		2.4	poor	
E2	5/30/2003	55-56		4,272,969	562,940	81	0	sand sagebrush shrubland	3.3	poor	w. meadowlark, lesser earless lizard, grasshoppers
E3	5/30/2003	57-58	E of Black Squirrel Creek	4,270,295	558,138	40	19	shortgrass prairie	0	excellent	**BTPD**, **mountain plover**, w. meadowlark
E4	7/1/2003	163-164		4,293,250	569,971	35	0	shortgrass prairie	>5	excellent	horned lark
K1	7/2/2003	185-186		4,253,212	638,164	157	0	shortgrass prairie	1.1	good	horned lark
K2	7/2/2003	183-184		4,259,621	636,211	171	0	shortgrass prairie	4.6	good	pronghorn, morning dove, w. meadowlark, killdeer
K3	6/19/2003	121-122		4,237,520	654,022	2000*	0	open water/riparian	2.4	poor	killdeer
K4	6/18/2003	106-107		4,254,227	724,283	889	222	riparian and associated upland (graminoids/forbs/shrubs)	0	excellent	**BTPD, burrowing owl**, killdeer, red-winged blackbird, swainson's hawk, w. harvester ants
K5	6/18/2003	104		4,245,607	702,327	2200*	0	open water	0.3	poor	American white pelicans, western grebe, seagulls, killdeer, red-winged blackbird
K6	6/18/2003	112-113		4,241,097	705,494	760*	0	open water/riparian	1	poor	Great blue heron, seagulls, killdeer, w. kingbird
K7	6/18/2003	114-115		4,241,419	696,583	2040*	0	open water/riparian	1.6	poor	killdeer
K8	6/18/2003	116		4,243,779	693,921	200*	0	open water	0.5	poor	killdeer
La1	6/24/2003	124		4,154,622	668,713	46	0	pinyon-juniper woodland	>5	poor	jackrabbit
La2	6/4/2003	59-61		4,131,417	553,454	480*	0	forb dominated grassland	0.3	fair	red-winged blackbird, w. meadowlark
La3	6/4/2003	64-65		4,108,635	571,356	40	0	shortgrass prairie	>5	fair	w. meadowlarks
La4	6/4/2003	66-67		4,117,583	571,060	47	0	shortgrass prairie	>5	excellent	w. harvester ants
La5	8/19/2003	206-207		4,131,877	590,832	121	0	juniper savanna	>5	fair	morning doves
La6	8/20/2003	210-211		4,127,224	595,084	313	0	juniper woodland	>5	poor	Swainson's hawk, horned lark, grasshoppers
La7	**No Permission**			4,145,466	618,138	41	0		>5	poor	
La8	8/20/2003	213		4,105,044	623,778	124	0	pinyon-juniper woodland	>5	poor	w. meadowlark, horned lark
La9	**No Permission**			4,101,795	629,025	81	0		>5	poor	
La10	8/29/2003	237-238		4,101,532	636,521	41	0	juniper savanna	>5	poor	
La11	8/29/2003	235-236		4,109,113	634,838	84	0	pinyon-juniper woodland	>5	poor	
La12	8/20/2003	214		4,106,835	661,559	42	0	pinyon-juniper woodland	>5	poor	pronghorn, morning dove, horned lark
La13	8/20/2003	216		4,101,324	666,787	40	0	juniper savanna	>5	poor	morning dove, horned lark, grasshoppers
La14	**Site obtained from the BLM by**					52	0		2.5		

	landowner										
La15	6/26/2003	146		4,142,976	667,799	49	0	shortgrass prairie	2.7	excellent	prairie rattlesnake, bull snake, w. meadowlark, morning doves
La16	8/20/2003	212		4,106,428	618,926	40	0	pinyon-juniper woodland	>5	poor	horned lark
La17	**No Permission**			4,109,547	613,716	38	0		>5	poor	
Li1	6/10/2003	71-72		4,379,261	656,572	64	0	shortgrass prairie	1.1	excellent	w. meadowlark, thirteen-lined ground squirrel
Li2	5/29/2003	31-32		4,284,510	627,938	193	0	shortgrass prairie	0.2	excellent	killdeer, w. meadowlark
Li3	7/1/2003	169-170		4,284,557	628,594	256	9	shortgrass prairie	0.1	excellent	**BTPD**, horned larks
Li4	5/29/2003	33-34		4,283,060	628,357	123	0	shortgrass prairie	1.4	good	lark bunting, w. meadowlark
Li5	7/1/2003	171-172		4,282,649	629,629	126	0	shortgrass prairie	1.8	good	lark bunting, w. meadowlark, horned lark, w. harvester ants
Li6	7/1/2003	177-178	Adobe Creek	4,277,525	635,886	80	0	shortgrass prairie	0.5	excellent	**swift fox**, horned larks
Li7	5/30/2003	53-54		4,273,411	629,155	82	0	shrubland	1.7	poor	w. meadowlark, morning doves, killdeer, nighthawk, grasshoppers
Li8 (North)	5/29/2003	36-37		4,272,820	617,067	80	0	shortgrass prairie	5	excellent	killdeer, horned lark, grasshoppers, dung beetle
Li8 (South)	5/29/2003	38-39		4,266,319	619,830	120	0	shortgrass prairie	3	excellent	killdeer, horned lark, grasshoppers, dung beetle
Li9	7/2/2003	187-188		4,269,010	622,013	65	0	shortgrass prairie	5	good	killdeer, w. meadowlark
Li10	5/29/2003	40-42		4,270,406	602,149	41	0	shortgrass prairie	4.3	fair	w. meadowlark
Li11 (North)	5/29/2003	43-44		4,270,017	599,839	40	0	shortgrass prairie	2.9	good	w. meadowlark
Li11 (South)	5/29/2003	45-46		4,268,026	601,627	40	0	shortgrass prairie	3.5	good	w. meadowlark
Li12	5/29/2003	48-49	Breckenridge Creek	4,264,960	590,118	327	120	shortgrass prairie	0	excellent	**BTPD**, nighthawk, w. harvester ants, dung beetle
Li13	7/1/2003	165-167		4,282,514	602,802	36	16	shortgrass prairie	0	excellent	**BTPD, burrowing owl**, pronghorn, horned lark
Li14	**DENIED ACCESS**			4,301,438	599,463	39	0		2.6	good	
Lo1	5/21/2003	10		4,489,216	647,461	43	0	riparian and associated upland (graminoids/forbs/shrubs)	4.9	poor	w. meadowlark, deer mouse, w. harvester ants
M1	5/22/2003	22-23		4,466,557	582,134	48	0	shortgrass prairie	>5	fair	w. meadowlark
M2	5/22/2003	20-21		4,478,928	599,723	37	0	shortgrass prairie	0.3	fair	w. kingbird, lark bunting, jackrabbit
M3	5/22/2003	15-17		4,469,975	597,552	91	0	shortgrass prairie	2.6	poor	
M4 (West)	5/22/2003	12, 13, 14		4,470,402	596,966	40	0	shortgrass prairie	3.2	poor	w. meadowlark, w. kingbird, magpie, w. harvester ants
M4 (East)	5/22/2003	18-19		4,470,557	599,747	80	0	shortgrass prairie	1.7	fair	w. meadowlark, w. kingbird, magpie, w. harvester ants

M5	6/13/2003	93-96		4,459,808	587,172	280*	0	open water/riparian	3.3	poor	mule deer, morning doves, shovelers, pintails, w. harvester ants
Pr1	6/27/2003	149-150		4,219,848	705,396	103	0	riparian communities	>5	poor	morning doves, lark bunting
Pr2	7/17/2003	198-199		4,218,981	737,599	78	0	tamarisk	1.5	poor	morning doves, lark bunting
Pr3	7/17/2003	200-201		4,209,948	751,223	43	0	sand sagebrush shrubland	3.5	poor	dung beetle, grasshoppers
Pr4	6/25/2003	127-128		4,190,009	713,419	83	0	shortgrass prairie	1.9	good	w. meadowlark, w. harvester ant, grasshoppers, butterflies
Pr5	6/25/2003	130		4,185,399	708,545	38	0	shortgrass prairie	1.2	good	
Pr6	6/18/2003	99-100		4,237,468	705,996	120*	0	open water/riparian	0.3	fair	w. meadowlark, w. kingbird
S1	**DENIED ACCESS**			4,534,006	726,999	43	0		>5	fair	
S2	**DID NOT ACCESS**			4,523,844	700,312	40	0		4.5	poor	
S3	**DENIED ACCESS**			4,530,314	702,503	39	0		1.75	poor	
Wa1	5/21/2003	8 and 9		4,475,911	639,039	640*	0	riparian communities	3.5	poor	morning doves
Wa2	6/10/2003	76		4,405,180	673,068	41	0	shortgrass prairie	0.2	good	
Wa3	6/10/2003	74-75		4,404,808	675,914	116	0	sand sagebrush shrubland	1.2	poor	w. meadowlark
We1	5/20/2003	4 and 5		4,457,447	571,248	1400*	0	riparian and associated upland (graminoids/forbs/shrubs)	>5	poor	w. kingbird, barn owl
We2	5/20/2003	1 and 2		4,465,211	562,803	2920*	0	riparian and associated upland (graminoids/forbs/shrubs)	>5	poor	w. meadowlark, bullsnake
Y1	6/11/2003	91-92		4,455,852	745,454	39	0	shortgrass prairie	1.8	fair	w. meadowlark
Y2	6/12/2003	88-89		4,453,444	745,502	39	0	shortgrass prairie	2	poor	w. meadowlark
Y3	6/11/2003	78-83		4,384,094	721,229	163	0	shrubland	4.6	fair	w. meadowlarks, turkey vulture, nighthawks
Y4	6/11/2003	84-86		4,389,898	743,812	30	0	riparian and associated upland (graminoids/forbs/shrubs)	2	poor	w. meadowlark

APPENDIX II

COLORADO NATURAL HERITAGE PROGRAM
BTPD DATA SHEET

BLM Parcel ID:_____ Date: ____-____-____ (yr-m-d) Observer(s) _____

Site Visit Chronology

Date	Surveyors

Photos taken: _____

UTM Zone:_____ Northing:_____ Easting: _____

LOCATORS:
County: _____ Quadcode: _____ Quadname: _____
Townrange: _____ Section: _____ TRS Note: _____
Directions from a Prominent Feature on a Map: _____
_____
_____
Road Directions to Site: _____
_____
_____
_____

ANIMAL SPECIES PRESENT

Species Name	date observed	date observed	date observed	Revisit needed?

Size + Condition + Landscape Context = predicted viability (e.g. "big + not weedy + excellent surroundings = A")
Size:_____
(How big is it?)
Condition : _____
(Quality of biotic and abiotic features/processes, stand maturity, species composition, stability of substrate, water quality, etc).
Landscape context : _____
(Quality of biotic and abiotic factors/processes of surrounding landscape, structure, extent, condition (fragmentation, hydrologic manipulation, etc.)

SITE DESCRIPTORS:
Total Tree cover: _____% Tree cover (%) by species: _____
Total Shrub cover: _____% Shrub cover (%) by species:_____
Total Graminoid cover: _____% Gram cover (%) species: _____
Total Forb cover: _____% Forb cover (%) by species: _____
Other comments (age class, reproduction, etc.): _____
_____
_

Site Description: (aspect, slope, geology, soils, % dominant veg cover as available):

Min Elev: _____ Max Elev: _____ Size in Acres: _____
Cultural Features: _____
STEWARDSHIP:
Land Use Comments: _____

Natural Hazards Comments: _____

Exotic Species Comments: _____

Off Site Consideration: _____

Info Needs: _____

Management Needs: _____

Management Comments: _____

What threats are found in this site and what are their sources? _____

Which species do these threats affect? _____

How does each particular stress affect the element(s)? _____

Will the stresses increase in the future? _____

Can the threats/stresses be reversed? _____

Management Urgency Comments: _____

MAP:
Sitemap(did you include a map?): Y N Map Date: _____ Mapper: _____
Route Walked: Y N

Species List:

APPENDIX III

Project name: _____
New: Y N Update: Y N Update eonum: _____

COLORADO NATURAL HERITAGE PROGRAM
ANIMAL ELEMENT OCCURRENCE FIELD FORM

General:
Element Common Name: _____
Element Scientific Name: _____
Observer(s):_____Survey Date:_____

Locational Information:
Quadname: _____Quadcode (if known): _____
Surveysite Name (from 7.5 Quad): _____
County: _____Elevation (range if applicable):_____
Legal Description (TRS & quarter quarter): _____
UTM Zone:_____Northing:_____Easting:_____

Type of Source Feature: ☐ **Single Source EO** ☐ **Multi-Source EO**
Size of observed feature: ☐ **none (point) ____sq. meters _____ sq. miles _____ acres**
Conceptual Feature Type: ☐ **Point** ☐ **Line** ☐ **Polygon**
Spatial Uncertainty: ☐**Negligible** ☐**Linear** ☐**Areal-Delimited** ☐**Areal-Estimated**
If Areal-Delimited, delimited by what?_____
If Areal-Estimated, ESTIMATED UNCERTAINTY = ____**meters ___feet ____miles**
(You are accurate to within *x* meters of the actual location.)

Directions:
Driving and hiking directions: _____
_____
_____
_____
_____

Occurrence data (Size, Condition, Landscape Context):
NUMBER OF INDIVIDUALS: _____ AGE(S) AND SEX(ES) (if known): _____
REPRODUCTIVE EVIDENCE: _____
EVIDENCE OF DISEASE, PREDATION OR INJURY: _____
EODATA ADDITIONAL COMMENTS: _____
_____
_____
_____
_____

General Habitat Description: (dominant plant community, habitat description, etc.) _____

ASSOCIATED VERTEBRATE TAXA: _____

EXOTIC SPECIES: _____

Management comments (past/present/future recommendations): _____

PREDOMINANT LAND USES: _____

Protection comments (Are there any protection plans or strategies in place?): _____

Land Owner: _____
Owner comments (special requests, permissions, circumstances): _____

Additional Comments: _____

Photo numbers (if applicable): _____
Specimens: Y N **Collection Numbers**: _____

Complete Below This Line if no EO Specifications exist
SIZE: A B C D (abundance, density) comments_____

CONDITION: A B C D (productivity, vigor of individuals)
comments_____

LANDSCAPE CONTEXT: A B C D (condition and extent of surrounding landscape)
comments_____

Eorank summary comments: _____

Eorank: A B C D E F H X **subrank:** i r **Eorank date:**_____

Bestsource: _____
_____Sourcecode:_____COUS

APPENDIX IV

Landowner Information

TRS Note explanation: quarter-quarter/quarter (e.g. SE/NW indicates the SE quarter-quarter of the NW quarter)

Parcel #	Contact for Surrounding Landowner	Contact Number	Legal Description	TRS Note
Ba1	Windsplitter Corporation (Clarence Buckley)	719-523-6590	T28SR50WS31	SW/SW
Ba2	Bob Gourley	719-326-5986	T28SR45WS6	SE/NW
Ba3	William Reed (JE Canyon Ranch)	719-523-4584	T28SR46WS11	
Ba4	William Reed (JE Canyon Ranch)	719-523-4584	T28SR46WS4	SE/NE
Ba5	Ira Shaffer	719-324-5895	Unalloted lands	
Ba6	Dan Wicher	620-697-4353	T35SR43WS12	
Ba7	Kletis Kelly	719-324-9277	T34SR43WS36	
Ba8	Dan Wicher	620-697-4353	T34SR42WS28	SE/NW
Ba9	Dan Wicher	620-697-4353	T34SR42WS22	
Be1	J-S Farms (John Sutphin, Jr.)	719-336-9006	T22SR50WS8,9	
Be2	Karney Land and Cattle (Patrick Karney)	719-456-0670	T21SR51WS35	SW/NW & NW/SW
Be3	Jack Sniff Ranch (Len Sniff)	719-336-4490	T23SR53WS10	NW/SE 1/4
Be4	N/A	N/A	T21SR52WS4,5	
Be5	J-S Farms (John Sutphin, Jr.)	719-336-9006	T21SR49WS31	
Be6 (West)	Jack Sniff Ranch (Len Sniff)	719-336-4490	T23SR49WS1	
Be6 (East)	Fort Bent Ditch Co.	719-336-2186	T23SR48WS6	
Be7	George Wilson	719-456-1002	T27SR51WS14	NE/SE
Be8	J-S Farms (John Sutphin, Jr.)	719-336-9006	T25SR53WS20	NE/SW 1/4
Be9	Keo Honey	719-384-8747	T24SR53WS18	NW 1/4
Be10	David C. Garrett	334-264-1512	T26SR50WS21	SE/SE
Be11	Pipe Springs Ranch (Steve McEndrae)	719-523-6720	T27SR49WS27&28	S27(NW/SW) S28(NE/SE)
Be12	WGW, Inc. (George Wilson)	719-456-1002	T27SR50WS13	NW/SE
Be13	WGW, Inc. (George Wilson)	719-456-1002	T27SR50WS2	S 1/2 of NW 1/4
Be14	David C. Garrett	334-264-1512	T26SR50WS23	NW/SW
Be15	David C. Garrett	334-264-1512	T26SR50WS11	SE
Be16	Lee Roy Riley, Jr.	405-478-1195	T26SR48WS3	NW
Be17	Fort Lyon Canal Co. (Manny Torez)	719-384-9169	T22SR53WS1	NW 1/4
E1	Dick Tanner	719-683-2273	T16SR62WS24	NW/NW

E2	Dick Tanner	719-683-2273	T17SR62WS1	E1/2 of the NE1/4
E3	Dick Tanner	719-683-2273	T17SR62WS4	SE/SE 1/4
E4	Roger Meinzer	719-478-2222	T14SR61WS35	NE/SW
K1	Lowell and Clifford Johnston	719-446-5206	T19SR54WS2	SE 1/4
K2	Lowell and Clifford Johnston	719-446-5206	T18SR54WS22	NW1/4E1/2, NE1/4W1/2
K3	N/A	N/A	T20SR52WS27-29, 32-34	
K4	William Dawson	719-729-3529	T19SR45WS10-11,14-15	
K5	Hatcher Farms, Inc.	719-438-5763	T20SR47WS4,5,8,9,10	
K6	Hatcher Farms, Inc.	719-438-5763	T20SR47WS22,23,26	
K7	Loren & Guyla Tempel	719-829-4580	T20SR48WS(many)	
K8	N/A	N/A	T20SR48WS10,15	S10(W1/2 of SW1/4), S15(W1/4, except SW/SW)
La1	Windsplitter Corporation (Clarence Buckley)	719-523-6590	T29SR51WS13	NW/NW
La10	Whitroy, Inc. (Mack Whittenburg)	505-278-2385	T34SR54WS28	NE/SE
La11	Bob James	580-426-2497	T33SR54WS32	E 1/2 of SE 1/4
La12	Everett Jackson	719-643-5435	T34SR51WS7	NW/SE
La13	Dunlap Lee Trust (Drew Dunlap)	719-643-5478	T34SR51WS7	NE/NE
La14	Leslie Morris (they now own this parcel)	719-523-4813	T31SR52WS2	NE/NE
La15	Windsplitter Corporation (Clarence Buckley)	719-523-6590	T30SR51WS23	SE/NW
La16	Louden Cattle Company (Richard Louden)	719-946-5513	T34SR56WS11	SE/NW
La17	N/A	N/A	T33SR56WS32	SW/NW
La2	N/A	N/A	T31SR62,63WS(many)	
La3	Tony Paulich	719-846-7950	T33SR61WS35	NE/SE1/4
La4	River Canyon Ranch (Brad Hall)	719-846-9676	T33SR61WS2	NE/NE1/4
La5	Gordon Lambeth	719-846-8400	T31SR59WS23,24	23(NE1/4S1/2) 24(SW/NW)
La6	Brad Hall	719-846-9676	T32SR58WS5,6	
La7	JE Canyon Ranch LLC (Corwin Brown)	719-523-4584	T30SR56WS10	NE/NE
La8	Louden Cattle Company (Richard Louden)	719-946-5513	T34SR55WS17	NW 1/4 except NE/NW
La9 (North)	Lester Gegenheimer	903-874-2164	T34SR55WS26	NE/NW
La9 (South)	Lester Gegenheimer	903-874-2164	T34SR55WS26	SE/NW
Li1	M&B Farms	303-841-2624, 303-841-6747	T6SR52WS2	SE 1/4 (bottom 1/2)
Li2	Bernard Bucklen Estate (Dan Meriweather)	719-446-5403	T15SR55WS35	NW 1/4
Li3	Ronald Parker	719-446-5389	T15SR55WS35, 26	35(NE1/4), 26(SE1/2-west

				1/2)
Li4	Bernard Bucklen Estate (Dan Meriweather)	719-446-5403	T16SR55WS2, 1	2(N1/2 of NE1/4) 1(NW/NW1/4)
Li5	Ronald Parker	719-446-5389	T16SR55WS1	
Li6	Dean M. Parker	719-446-5260	T16SR54WS27	NE/NW and NW/NE
Li7	Bernard Bucklen Estate (Dan Meriweather)	719-446-5403	T17SR55WS1	
Li8 (North)	Horse Creek Grazing Assoc. (Marlon Mason)	719-267-3599	T16SR56WS3	W1/2 of SE1/4
Li8 (South)	Horse Creek Grazing Assoc. (Marlon Mason)	719-267-3599	T17SR56WS25	S1/2 and NE1/4 of SW1/4
Li9	Melvin Neighabauer	719-462-5776	T17SR55WS18	S1/2 of SE--no actual sections in this area
Li10	Paul Jenkins	719-446-5376	T17SR57WS18	NE/NW 1/4
Li11 (North)	Paul Jenkins	719-446-5376	T17SR58WS14	SE/NE 1/4
Li11(South)	Paul Jenkins	719-446-5376	T17SR58WS24	NE/SE 1/4
Li12	Harry Doak	719-446-5334	T17SR59WS35	E1/2 of section
Li13	Betty Jean Newell	719-446-5205	T16SR57WS6	NE 1/4
Li14	Carlos Lucero	719-446-5424	T14SR58WS2	NE/SE
Lo1	State Wildlife Area (DOW Office in Brush)	970-842-6300	T7NR53WS26	NE/SE 1/4
M1	Dallas Bowles	N/A	T4NR59WS6	NW/NW 1/4
M2	Mike Groves	970-645-2247	T6NR58WS26	NE/SE 1/4
M3	Susan Priemel	970-867-5174	T5NR58WS27	NE/NW 1/4 and NW/NE 1/4
M4 (West)	James Whitney	970-867-9143	T5NR58WS22	SW/SW 1/4
M4 (East)	James Whitney	970-867-9143	T5NR58WS23	E1/2 of SE 1/4
M5 (South)	Bijou Irrigation Company (Steve Smith)	970-483-7426	T4NR59WS27	South Central Half
M5 (North)	Bijou Irrigation Company (Steve Smith)	970-483-7426	T4NR59WS22	SW/SW
Pr1	Arkansas Valley Alfalfa Milling Co. Inc.	719-829-4866	T22SR47WS26	
Pr2 (West)	Sharon & Michael Winters	719-734-5203	T22SR43WS31	NE/SW 1/4
Pr2 (East)	Sharon & Michael Winters	719-734-5203	T22SR43WS31	SE/SE 1/4
Pr3	Sandhill Angus Ranch	719-327-2643	T23SR42WS33	NE/SE 1/4
Pr4	Ragsdale Farms, Inc. (John Stulp)	719-336-4116	T25SR46WS33, 34	
Pr5	Lawrence A. Vashus	719-336-4220	T26SR46WS7	
Pr6	D. James & Nellie M. Ellenberger	719-336-4238	T21SR47WS1	N squared NW SE/NW
S1	Al Luke	719-474-9948	T11NR44WS18	

S2	S & D Ranch (Brian Ham)	719-522-4776	T10NR47WS17	NE/SW
S3	Jack Devie	719-463-5549	T11NR47WS28	NE/SE
Wa1	N/A	N/A	T5NR54WS1	North Part
Wa2	Dan Miller	719-357-4216	T35SR50WS21	NE/SE
Wa3	Joneal Young	970-357-4386	T3SR50WS23	SW (east 1/2) NW/SE
We1	N/A	N/A	T3N, R60WS31	
We2	Riverside Irrigation Company (Joe Stovell)	970-353-1780	T4NR61WS8	Northern Part of Section
Y1	Caribou Land & Cattle (Bill Cure)	719-332-0606 Office 719-332-5770 Home	T3NR43WS24	NE/NE
Y2	Gleason Dryden	719-332-5395	T3NR43WS25	SE/NE
Y3 (West)	Clarence V. McDonald	719-362-4355	T5SR45WS31	SW/NE
Y3 (Central)	Clarence V. McDonald	719-362-4355	T55SR45WS32	NE/SW
Y3 (East)	Homm Ranches, Inc. (Larry Homm)	719-346-7099	T5SR45WS27	SW (eastern half)
Y4 (West)	Bureau of Reclamation (Loveland Office)	970-667-4410	T5SR43WS15	SW (just a sliver)
Y4 (Central)	Bureau of Reclamation (Loveland Office)	970-667-4410	T5SR43WS15	NE (just a sliver)
Y4 (East)	James K. Hutton	719-332-0958	T5SR43WS11	SW (just a sliver)

APPENDIX V
Plant List

Common Name	***Latin Name***
Alkali sacaton	*Sporobolis airoides*
Aster	*Aster spp.*
Bindweed	*Convolvulus arvensis*
Bitterbrush	*Purshia tridentata*
Bitterweed	*Hymenoxys odorata*
Black grama	*Chondrosum hirsutum*
Blackweed	*Aster subulatus var. ligulatus*
Blazingstar	*Nuttalia reverchonii*
Blue grama	*Chondrosum gracile*
Buffalobur	*Solanum rostratum*
Buffalogourd	*Cucurbita foetidissima*
Buffalograss	*Buchloe dactyloides*
Cheatgrass	*Bromus anomalus*
Cholla	*Cylindropuntia imbricata*
Common sunflower	*Helianthus spp.*
Cottonwood	*Populus angustifolia*
Crested wheatgrass	*Agropyron desertorum*
Foxtail barley	*Setaria spp.*
Fringed sagebrush	*Artemesia frigida*
Galletagrass	*Hilaria jamesii*
Gayfeather	*Liatris spp.*
Greasewood	*Sarcobatus vermiculatis*
Hedgehog cactus	*Echinocereus spp.*
Hog potato	*Hoffmanseggia glauca*
Locust	*Robinia spp.*
Indian blanketflower	*Gaillardia pinnatifida*
Inidian ricegrass	*Oryzopsis spp.*
Junegrass	*Koeleria macrantha*
Juniper	*Juniperus communis*
Kochia	*Kochia scoparia*
Little bluestem	*Schizachyrium scoparium*
Lupine	*Lupinus spp.*
Milkweed	*Asclepias spp.*
Mountain mahogeny	*Cercocarpus montanus*
n/a	*Juncus articus ater*
Needle and thread	*Hesperostipa comata*
Oak	*Quercus grisea*
Penstemon	*Penstemon spp.*
Pepperweed	*Lepidium latifolium*
Phlox	*Phlox andicola*
Pinyon pine	*Pinus edulis*
Pricklepoppy	*Argemone polyanthemos*
Prickly pear cactus	*Opuntia polyacantha*

Rabbitbrush	*Chrysothamnus nauseosus*
Red-three awn	*Aristida tridentata*
Ricegrass	*Oryzopsis spp.*
Rush	*Juncus articus ater*
Russian olive	*Elaeagnus angustifolia*
Russian thistle	*Salsola iberica*
Rye	*Secale cereale*
Sand dropseed	*Sporobolis cryptandrus*
Sand sagebrush	*Artemisia fillifolia*
Scarlet globemallow	*Sphaeralcea coccinea*
Side-oats grama	*Bouteloua curtipendula*
Skunkbrush	*Rhus aromatica subsp. trilobata*
Slimflower scurfpea	*Psoralea tenuiflora*
Smooth brome	*Bromus inermis*
Snakeweed	*Gutierrezia sarothrae*
Snow-on-the-mountain	*Agaloma marginata*
Wild buckwheat	*Eriogonum annuum*
Spiderwort	*Tradescantia occidentalis*
Tamarisk	*Tamarix ramosissima*
Thistle	*Carduus spp.*
Verbena	*Verbena bracteata*
Western wheatgrass	*Pascopyrum smithii*
White sweetclover	*Melilotus alba*
Woolly plantain	*Plantago patagonica*
Yellow goatsbeard	*Tragopodon dubius*
Yellow sweetclover	*Melilotus officinalis*
Yellow-wholly white	*Hymenopappus flavescens*
Yucca	*Yucca glauca*